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TITLE OF THESIS/*TITRE DE LA THÈSE* CONTEXT EFFECTS IN MEMORY FOR INFORMATION FOCUS: AN EXPERIMENTAL STUDY OF ENGLISH CLEFT AND DATIVE SENTENCES

UNIVERSITY/*UNIVERSITÉ* University of Alberta

DEGREE FOR WHICH THESIS WAS PRESENTED/*GRADE POUR LEQUEL CETTE THÈSE FUT PRÉSENTÉE* Master of Science

YEAR THIS DEGREE CONFERRED/*ANNÉE D'OBTENTION DE CE GRADE* 1977

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CONTEXT EFFECTS IN MEMORY FOR INFORMATION FOCUS: AN EXPERIMENTAL STUDY OF ENGLISH CLEFT AND DATIVE SENTENCES

by

(C) RONALD H. SMYTH

A THESIS

SUBMITTED TO THE FACULTY OF GRADUATE STUDIES AND RESEARCH

IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE

OF MASTER OF SCIENCE

IN

PSYCHOLINGUISTICS

DEPARTMENT OF LINGUISTICS

EDMONTON, ALBERTA

FALL, 1977

THE UNIVERSITY OF ALBERTA

FACULTY OF GRADUATE STUDIES AND RESEARCH

The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies and Research, for acceptance, a thesis entitled "Context Effects in Memory for Information Focus: An Experimental Study of English Cleft and Dative Sentences", submitted by Ronald H. Smyth in partial fulfilment of the requirements for the degree of Master of Science in Psycholinguistics.

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Date October 14, 1977

This thesis is dedicated

to the memory of

Don Hauk

ABSTRACT

It is argued that the linguistic notion of sentence theme has no formal or psychological motivation, and that the only viable notion of focus is that of information focus. An analysis of English cleft and dative sentences in terms of the distribution of Given and New information suggests that (a) the syntactic properties and functional interpretation of cleft structures vary according to the information distribution of the discourse in which they appear, and (b) dative position in English is not optional, as has been traditionally assumed, but is predictable on the basis of the informational status (Given or New) of the post-verbal NP's.

These analyses are supported by the results of two recognition-memory experiments using Sachs' (1967; 1974) procedure. In Experiment 1, it is shown that subjects are more successful at detecting changes from cleft subject to cleft object and vice versa when the clefted NP is New and the rest of the sentence is Given than when both NP's are New. Clefts having the New-New distribution are said to fulfill a discourse-independent "identifying" function.

Experiment 2 demonstrates that speakers find the relative ordering of post-verbal NP's in dative constructions to be significant when one NP is Given and the

other is New. With this information distribution, the order is obligatorily Given-New, and reversals are easily detected by subjects in a delayed recognition task. However, if both NP's are either Given or New, the relative ordering is unconstrained, and changes in NP position are poorly recognized.

Sentence-bound theories are shown to be incapable of expressing these regularities, since information focus is not always marked by phonological prominence. The Information Structure approach, which allows the mapping of contextual information onto the ordering of elements, is shown to provide a suitable descriptive framework.

ACKNOWLEDGEMENTS

I am indebted to the members of my committee and to my fellow students for their helpful comments and kind assistance in getting this project completed on time. In particular, I would like to thank my supervisor, Dr. Gary Prideaux, for expecting the impossible, thereby rendering it possible; Dr. John Hogan, for seemingly interminable discussion of matters statistical; and Drs. Lois Marckworth and Tom Priestly, whose careful reading of earlier drafts prevented many errors of both form and content from appearing in this thesis. I would also like to acknowledge Dr. Prideaux's aid in developing the linguistic formalisms presented in Chapter Five.

Marie Desrochers of College Universitaire St. Jean and Georgia Magnera of the Department of Linguistics were kind enough to allow me to recruit subjects from their classes; I would like to thank them, as well as my own students, for their cooperation. Georgia also served as my guide through the jungle that is *fmt.

This thesis would not have been possible without encouragement and moral support from those close to me: Albi Calman, Peter Assmann, and Ruthi Salmon were always willing to lend an ear, and everyone else who has come in contact with me over the past four months has shown

remarkable patience in dealing with my (hopefully temporary) derangement. Peter Field has had to bear the brunt of this craziness, and somehow a simple acknowledgement seems inadequate. For once, words escape me. (The clicking and whizzing should stop soon, if that's any consolation.)

These two years of graduate study were supported by the Department of Linguistics, through research and teaching assistantships, and by the Francis P. Reeve Foundation.

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CHAPTER ONE

INTRODUCTION

1.1 Linguistic Packaging Phenomena

This study is an experimental investigation of some specific effects of linguistic context on the communicative functions of sentence types. The general area of inquiry is that of grammatical "focus", a term whose many uses have in common a notion of "semantic prominence" or "importance" (e.g. Andrew, 1974; Chafe, 1970; Chomsky, 1971; Hornby, Hass and Feldman, 1970; Millar, 1976). Thus a focused element is one which is more "important", in some usually unspecified sense, to the meaning than the other elements of the sentence.

One purpose of the present study is to show that the various notions of semantic prominence advanced by linguists and psycholinguists have different empirical consequences, and that they can and should be investigated separately.

In an attempt to standardize the terminology in this rapidly-expanding area of research (see Clark and Clark,

1977, for a review of recent work), Chafe (1976) has introduced the term "packaging" as a generic term for the range of phenomena which

> have to do primarily with how the message is sent and only secondarily with the message itself (p28).

Included under this general rubric are a variety of terms for phenomena which have all at one time or another been claimed to affect the form of sentences: givenness, contrastiveness, definiteness, topicalisation, thematicity, emphasis, focus of attention, figure-ground relations, conceptual focus, psychological subject, and so on.

The aim of the present study is to show that in establishing a taxonomy of psychologically viable packaging phenomena, and especially if an attempt is made to incorporate one's findings into a descriptive system, it is essential to note that the relevant data are not to be found within individual sentences. Rather, the notions of givenness, contrastiveness, etc., make sense only with respect to other elements in a surrounding discourse, and often with respect to the extra-linguistic environment. Consequently, packaging effects cannot be ascribed to sentence "types" per se, but only to types-in-context.

1.2 Contextual Motivation

The most important concept to be developed in this thesis is that of contextual motivation. A packaging device will said to be contextually unmotivated when the choice of which element is to be semantically prominent is not based on the fulfillment of expectations developed by a context. Contextually motivated focus will be distinguished by the fact that the choice of the element which is to be semantically prominent is largely determined by the preceding context, and the choice of a particular device for that context is restricted to a small range of roughly equivalent options.

For example, it will be claimed in the following chapters that the position of direct and indirect object NP's is free in English dative sentences only if both provide either Given or New information:

(1) ...I'd brought some wine, and opened it by pushing the cork inside with a twig.

(a) Then I passed the bottle to Joey.
(b) Then I passed Joey the bottle.

In 1(a), both the fact that a bottle was passed (rather than something else), and the fact that the recipient was Joey (rather than someone else) are presented as New information. The semantic, stylistic, or rhythmic features which might determine the speaker's choice of dative position in such instances are poorly understood. However, if one of the two NP's contains New information, and the

other is Given by the preceding context, the New NP must appear in final position, assuming that the sentence is to be pronounced with falling intonation and non-contrastive sentence stress on the last word:

(2) ...(concerning a valuable book) He was undecided as to whether it should go to his daughter Margaret, or to young Steve Bancroft, the grandson of his first mate on that trip.

(a) #Finally, he left Margaret the book.
(b) Finally, he left the book to Margaret.

(Throughout this work, the # will indicate an contextually inappropriate utterance, and underlining will indicate non-contrastive sentence stress.) Alternatively, the order of elements in 2(a) may be maintained if the new element receives the heaviest stress:

(c) Finally, he left Margaret the book.

Similarly, cleft sentences can indicate New information by clefting an NP, although the process is somewhat more complicated:

(3) (c) "I don't know what's wrong with Jane," said Mr. Field. "She's still acting strangely. And we don't know what caused the fire. It could have been lightning, faulty wiring, vandals, who knows. And I guess we'll never know."
"Mr. Field," I said,

(a) "it was Jane that set the fire."
(b) # "It was the fire that Jane set."
(c) "it's the fire that's affecting Jane. Do you know why? Because she set it."

Sentence (b) is inappropriate because fire, which is Given, is clefted, while Jane , which is the most important New information, is not. Moreover, the identification of Jane as the culprit in contrast to other possibilities (lightning, faulty wiring, vandals) is an important function of the cleft structure, while clefting of fire is contextually unmotivated. On the other hand, sentence (c), which clefts fire, is appropriate because the identification of the fire (as affecting Jane), is newly relevant, and provides an implicit contrast to other possible causes of her strange behaviour. Thus (a) is strongly motivated by the expectation of a contrast, while (b) is inappropriate because it focuses on Given information, and (c) treats as New an element which was Given - and thus not a candidate for clefting - in (b). Obviously, then, any analysis of the semantics of cleft and dative sentences must take at least these primary observations about context into account.

1.3 Overview

The semantic basis of appropriateness conditions has recently sparked a new interest in functional studies by American linguists, while both Prague and London School theorists have been working in this area for many years. Chapter Two is devoted to a survey of linguistic treatments of these and other packaging phenomena, and develops the notion of contextual motivation in greater detail.

Chapter Three reviews experimental approaches to these problems and raises objections to the practice of using isolated sentences as stimulus materials in such research. Justification is offered for using a recognition-memory procedure to investigate experimentally the role of contextual motivation in the interpretation of English cleft and dative sentences. The hypothesis is advanced that if linguistic context influences the packaging properties of clefts and datives, then systematic changes in the degree to which a context motivates a syntactic pattern should result in predictable changes in the memorial "salience" of that device. In a recognition-memory task, therefore, one would predict that focus-changing alterations of stimulus sentences should be more readily recognized than focus-preserving changes (cf. Hornby, 1972), and that this effect should be stronger when the original sentences are contextually motivated. Both expectations are fulfilled by the experiments reported in Chapter Four.

Chapter Five is a discussion of the relevance of these results to linguistic descriptions of the sentence types under consideration, and to previous experimental work whose findings are not compatible with those reported here. Refinements in the experimental technique and further avenues of research are also discussed.

CHAPTER TWO

LINGUISTIC ACCOUNTS OF PACKAGING PHENOMENA

2.1 A Return to Functionalism

If American Structuralism was rejected by European linguists as a "meaningless" pursuit, the advent of transformational-generative grammar (TGG) and the preoccupation with formalizing syntactic regularities must have appeared to be another step in the wrong direction. While American workers such as Fillmore (1965), Kuroda (1968), and Jacobs and Rosenbaum (1968) were grappling with the technical problem of formulating Passive and Dative rules which would interact to allow the generation of sentences such as (1) and (2),

(1) A love seat was given to Albi by Chris.

(2) A love seat was given by Chris to Albi.

Halliday (1967a,b; 1968) was attempting to explain how variations in semantic context, clause structure, information distribution, stress, and intonation affect the meaning and appropriateness conditions for such sentences. At the same time, and for many years previously, Prague School linguists (e.g. Mathesius, 1939; Sgall, 1967;

Svoboda, 1968) had been developing a theory of "Functional Sentence Perspective" based on the role of Topic-Comment Articulation (TCA) in sentence production and comprehension.

American linguists have only recently begun to take these problems seriously. Langacker (1974), speaking of the resurgence of interest in functional matters, observes that

> ...syntactic questicns per se have largely been overshadowed. Indeed, it is difficult tc conceive of any further substantial progress in syntactic theory and description being made in isolation from these other domains. (p. 630)

The functional type of approach to linguistic description is an attempt to discover correlations between conditions of use on the one hand, and the syntactic, lexical and prosodic organization of sentences on the other. This represents a broadening of the range of regularities which linguistic theory must account for, and the correlations thus identified may allow one to infer psychological strategies used by speakers and listeners in actual language use. Four functional approaches will be described in the following sections, providing the basis for a functional analysis of English dative and cleft sentences.

2.2 The Prague School: TCA

Firbas (1967) has stated that the goal of Prague School theory is "to make it possible to understand how the semantic and grammatical structures function in the very act of communication" (p. 137). The most exhaustive account of recent Czech thought is that of Sgall, Hajicova and Benesova (1973), whose grammatical system generates semantic representations directly. An essential part of each is its Topic-Comment Articulation (hereafter, TCA). The topic-comment distinction is simply the difference between what is being talked about (the "theme"), and what is said about it (the "rheme"). Mathesius (1928) noted that in Czech, which has relatively free word order, TCA determines the sequencing of sentential elements: the neutral order is topic-comment, and the marked order, comment-topic, is found in "emotive" sentences. Thus, in Czech at least, linear order is not sufficient for thematic analysis, but must be supplemented by intuitive judgements (Tyl and Firbas, 1971). Each semantic unit is said to have a value on the scale of "communicative dynamism" (CD), which reflects its importance relative to the rest of the sentence. This intuitive notion determines which element is to be thematic.

TCA is also claimed to have syntactic effects in languages with relatively fixed word order. English, for example, does not exploit simple constituent movement as a

thematic device; the lack of surface case markings would render many sentences ambiguous. Thus (3) and (4)

(3) Gary broke the guitar.

(4) The guitar broke Gary.

are not thematic variants. However, devices such as passivization are claimed to function in the same way as word order in Czech; in (5), the guitar is the theme and the sentence expresses the same semantic relations as (3).

(5) The guitar was broken by Gary.

This analysis claims that in (3), for example, Gary has low CD, and is topicalized, appearing in the initial "thematic" position.

The definition of theme in terms of CD risks circularity. As a theoretical prime, CD does have the advantage of triggering movement rules such as Passive and Dative (cf. also Chafe, 1970; Chambers, 1970), but the extent to which considerations of CD influence the speaker's choice or the listener's interpretation of syntactic or phonological patterns is unknown. Judgements of what a sentence is "about" are far from consistent, as Hornby (1972) has shown in a study designed to reveal how people use theme in sentence comprehension. The claim that an element is thematic because it has low CD, and that it has low CD because it is thematic does not explain the conditions under which sentential elements are assigned varying degrees of importance by language users.

Prague School theory distinguishes between the "first level" of TCA, which accounts for theme and rheme, and a "second level", which allows an independent analysis of what is currently called the "Given-New" dichotomy (Clark & Haviland, (1974, 1977). By "Given" is meant "points of the information stored in the hearer's memory", while New information serves in the "modification of these points attempted by the speaker" (Sgall et al., 1973, p. 25). In Prague School theory, Given information is considered to have low CD and usually constitues the theme, although this is not always the case. Consider the following:

(6) On Christmas Eve we expected Uncle Fred and Aunt Bertha.
(7) Uncle Fred came first.
(8) First came Uncle Fred.
(9) Aunt Bertha came first.

Sgall et al. assert that in (7) "one speaks about Uncle Fred and states when he came", while in (8), "one speaks about the one who came first, and states who he was" (p. 18). In the sequence (6)-(7), the existence of Uncle Fred is presumably in the addressee's memory when (7) is uttered, and is the theme; in (8), the fact that he came first is New information, and is the rheme. Thus thematic information is not necessarily Given according to this analysis.

TCA theory does not express the similarity between the functions of the thematic information of (7) and (9). It seems clear that although <u>Uncle Fred</u> is in the listener's memory when (7) is uttered, his identity as the one who came

first is the newly asserted information; (9) could as easily have been the sequel to (6). It seems that both pieces of information - the identification and the order of arrival - are New, and the assertion that the initial element is thematic can only be taken as an arbitrary analysis.

TCA theory is most concerned with describing the effects of CD on syntactic form and does not provide a full analysis of the relationship between theme, Givenness and prosodic effects. Sgall et al., for example, restrict their discussion almost entirely to sentences with major stress falling on the last word, mark no other degrees of stress, and disregard intonation contours. That there may be a correspondence between New information and prosody is suggested only in this footnote:

> ...it is natural that (the new information) may be - as it is in the European languages - marked by bearing the intonation centre of the sentence. (p. 288, fn. 14)

The Prague School principles will now be applied to an analysis of English dative and cleft sentences. Sgall et al. state that indirect objects have a higher inherent CD than direct objects, since sentences such as

(10) I gave a boy an apple.

can be completely "unbound" - they can be used in contexts where all the information contained in the sentence is New. Dative-moved sentences, it is claimed, are contextually bound. For example, (11) is said to presuppose that an

apple was given to someone:

(11) I gave an apple to a boy.

This argument is refuted by contexts such as (1) in Chapter One, repeated here as (12):

(12) ...I'd brought some wine, and opened it by pushing the cork inside with a twig.

(a) Then I passed the bottle to Joey.
(b) Then I passed Joey the bottle.

Sentence 12(a) may presuppose that the wine was in a bottle rather than some other container (as indicated by the use of the definite article), but it certainly does not presuppose that a bottle was passed. Rather, this is stated as New information. The basis for the suggestion that indirect objects have higher CD is thus unclear.

The second level of TCA predicts that if either the direct or the indirect object is New, the order will be Given-New, so long as no other element in the sentence has higher CD than the New element. This may be verified by applying the Question Test (Hatcher, 1956), in which one NP is mentioned in the question and the other is the requested new information.

(13) Who did you sell the potatoes to?

(a) I sold the potatoes to Dolly.

(b) #I sold Dolly the potatoes.

This analysis is adequate for sentences with so-called "normal" intonation, but the order Given-New is not obligatory, provided the intonation centre falls on the new

NP:

(13) Who did you sell the potatoes to?

(c) #I sold the potatoes to Dolly.
(d) I sold Dolly the potatoes.

It is important for later discussion to note that there exists a fairly common intonation contour in which the pitch falls in steps and no element attains pitch prominence. This contour seems to convey a "matter-of-fact", and perhaps somewhat impatient attitude on the part of the speaker:

(14) So who did you finally sell the potatoes to?

(a) ^{1}I ^{3}sold the po^{2}tatoes to ^{1}Dolly.
(b) # ^{1}I ^{3}sold ^{2}Dolly the po^{1}tatoes.

In this representation, the superscripts 1-3 indicate low to medium pitch, and no element can be said to be more pitch-prominent than any other. This contour is used for the dative sentences in the present study in order to allow the investigation of the relative importance of pitch and word order in the assignment of focus to elements in a clause. This should not be viewed as an unnatural manipulation, although many linguists have limited their studies to so-called "normal" intonation, such as that of (13a-b) above. As Schmerling (1971) has observed, there is nothing "special" about the many alternative stress and intonation patterns of English, and in fact the "normal" stress so often referred to in the literature is actually a rather uncommon citation pronunciation. The contour used in the present study will provide a means of evaluating the

adequacy of the various theories in accounting for both stress and linear order as determinants of focus in dative sentences. For example, Prague School theory would predict the position of the object NP's for this contour on the basis of the higher CD for New information, without mention of stress.

Firbas (1970) suggests that cleft sentences exhibit the "marked" comment-topic order, since the clefted element is "singled out for particular attention, bringing it into relief" (p. 127). This would presumably also hold for reverse pseudocleft (RPC) sentences. Thus both (15) and (16) have marked TCA:

(15) It was Tracey who lost an eye. (cleft subject)
(16) Tracey was the one who lost an eye. (RPC subject)

Sgall et al. state that the clefted element is contextually free (New). This is the case in (17), where noise is New, and requested by the preceding question. However, such sentences may also occur in contexts where the clefted element has been recently mentioned:

(17) "Is something bothering Ellen?" asked the Marquis. "Yes," Ethel replied. "It's the noise that's bothering her. Can't you do something about those cries..."

(18) (My brother and I have had a lot of good times together...) It was my brother that introduced me to the Marquis. We were at a party in Versailles...

A more precise statement, accounting for both cases,

would be that the clefted element must be informationally New in a way which is not dependent on prior mention. In (18), my brother, although previously mentioned, is newly identified as the one who introduced the speaker to the Marquis. Notice also that the preamble in parentheses is not necessary to the discourse. That is, my brother could be New - not previously mentioned - and not invited by the context. The clefted element in (17) also serves to identify, but in addition it provides information that is invited by the preceding context. The theory would treat both clefted elements as having high CD, but would not specify the difference in contextual motivation between the two types.

In summary, TCA theory suffers in some respects from a lack of explicitness. Although the syntactic form of a sentence can be explained in part by its CD, the theory does not describe the various circumstances under which a context can lend importance to a constituent. The CD is assigned intuitively in a post-hoc analysis, and serves as a cover term for a variety of contextual factors having similar syntactic effects.

2.3 Halliday's Theme System

Halliday (1967a,b; 1968) treats packaging phenomena as one of three semantic subsystems functioning within the sentence. The transitivity system describes the syntactic options available in "the representation of processes and relations, and of objects, persons, etc. as participants in them" (1967b, p. 199); it is roughly comparable to Fillmore's (1968, 1971) notion of deep case. Under this analysis, (19) and (20)

(19) She washed the clothes.

(20) The clothes were washed.

are characterized as involving directed action, action on a goal, and one or both participants, the actor and the goal. The differences in surface form are considered to reflect deeper semantic distinctions.

The mood system provides options in terms of the speaker's role:

> ...the speaker may inform, question, or command; he may confirm, request confirmation, contradict or display any one of a wide range of postures defined by the potentialities of linguistic interaction. (1967b, p. 199)

Some basic syntactic reflexes of mood are the declarative, interrogative, and imperative sentence forms.

The theme system specifies six sets of structural options, of which three are relevant here: "information" is realized as prosodic features in a clause; "thematization"

determines the linear order of elements, and "identification" is a semantic function associated with certain constructional types.

Halliday claims that the distribution of "tone group" boundaries in a discourse blocks out information units, which reveal "what the speaker chooses to encode as a unit of discourse" (1967b, p. 202). In the unmarked case, information units correspond to single clauses, but they may also extend across clause boundaries, and a single clause can contain two or more tone groups. Tone groups consist of an obligatory "tonic segment", which may be simple or compound (i.e. having level tone throughout or a change in tone somewhere within), and an optional pretonic segment. Within each tone group, the "information focus" is identified as the phonologically prominent element.

There are some problems with the identification of information foci. First, it is questionable whether tone groups can be consistently identified. Halliday himself concedes that

> Each information unit is realized as one tone group, in the sense that information structure specifies the boundaries of the tone group to within certain limits, its exact location being determined by considerations of phonological structure. (p. 202, emphasis added)

There is no explanation of what specific phonological structures are relevant, and Halliday adds that the tone

group

> ...is co-extensive, within certain limits determined by the rhythm, with the information unit. (p. 203, emphasis added)

The empirical status of Halliday's claim that tone groups reflect the speaker's choice of encoding units is also uncertain. There exists no conclusive evidence that speakers purposefully arrange chunks of information into these groups for the benefit of the hearer, nor is it obvious that such organization is subject to choice. On the other hand, these difficulties are not insurmountable, since intonation peaks can be identified without the constraint that tone groups correspond to purposefully organized chunks of information.

Problems of this sort arise only because of Halliday's desire to find a strict correspondence between phonological phenomena and the information subsystem. This implies that intonation is a necessary cue to the information distribution of the clause, and is used by speakers to signal points of New information. Halliday states that the point of pitch prominence in a tone group is always New information, and that the rest of the tone group is Given. New information is defined as that which the speaker intends to be informative, whether or not it has been mentioned previously. This is a useful extension of the Prague School notion of New information, but poses a problem for the distinction between focus and theme: is thematic information

also intended to be informative? If so, how can the two types of information be distinguished? And what evidence is there that listeners interpret theme as part of the semantic representation of every sentence? If it is not intended to inform, in what sense should it be treated as a semantic phenomenon?

Halliday approaches these questions by stating that Given and thematic information are independent variables within the clause:

> ...while 'given' means 'what you were talking about (or 'what I was talking about before'), 'theme' means 'what I am talking about' (or 'what I am talking about now'). (1967b, p. 212)

That 'given' and 'theme' do not always coincide is shown by sentences such as

(21) So who's the captain?
Lauretta is the captain.

Here it is given that someone is the captain, and the New information is the theme because of its initial position. However, it would appear that the definition of theme in terms of linear order is not always satisfactory. Although most workers seem to accept that thematic and focus "information" are contained in single lexical items (such as Lauretta in (21)), judgements of what a sentence is about are difficult to make. For example, (21) may be about Lauretta, or about who the captain is, or about the speaker's opinion concerning who the captain is, and so on.

Since Halliday's definition of theme is presumably based on intuitive judgements of what a sentence is "about", it should - but cannot - account for all such intuitions.

Givenness is not always a matter of linguistic context, and may simply be a presupposition on the part of the speaker:

> ...the given is offered as recoverable anaphorically or situationally...what is new is in the last resort what the speaker chooses to present as new, and predictions from the discourse have only a high probability of being fulfilled. (1967b, p. 211)

Halliday states that since there is a tendency for Given to precede New, and since in English the tonic most often falls on the last syllable in a "tone group", there is a kind of "unmarked focus":

(22) (a) We baked some cookies for Joyce.
(b) We baked Joyce some cookies.

In these sentences, the stress falls on the final element, and this is partially independent of whether cookies is Given or New. Thus 22(a) would be an appropriate answer to either "Who did you bake some cookies for?" (with cookies as Given) or "What did you do?" (with both cookies and Joyce as New); 22(b) would be an appropriate response to "What did you bake for Joyce?", "What did you do for Joyce?", and "What did you do?". The information focus is either the last NP, the last two NP's, or the entire sentence, depending on the context.

Halliday's third thematic function is that of "identification" and is characteristic of clauses in which "one of the participants is definable by participation in the process" (p. 224). The participant is called the "identifier", and the clause functions to show coreference between the identifier and an "identified". Equational sentences exhibit the identifying function:

(23) That man is the president.

That man is the identifier, and the president is the identified. This semantic function is similar to the theme/rheme distinction, and in fact Halliday states that the first element, the identifier, is always the theme.

We can review Halliday's treatment of packaging effects by applying it to an analysis of English dative and cleft sentences. The only aspect of this theory which is relevant to dative position is the Given-New distinction. Consider the following:

(24) Who did you sell the potatoes to?
(a) I sold the potatoes to Dolly.
(b) #I sold Dolly the potatoes.
(c) I sold Dolly the potatoes.
(d) #I sold the potatoes to Dolly.

Halliday's theory accounts for 24(a) and (b) on the basis of the ordering of Given and New information. The information focus is in final position, indicating that the final element must be the new information, Dolly. According to Halliday's analysis, the New information in sentences such as 24(c) and (d) must be stressed if it is not in final

position. Halliday's phonologically-based theory predicts correctly that stress is the more important factor, since the last NP is not interpreted as focal (New) if it is not the intonation centre. However, the theory fails in the analysis of sentences which have no pitch-prominent element. Although the Given-New order is the determining factor in this case (e.g. (14) above), a phonologically-based system cannot identify the information focus for such sentences.

Both cleft and RPC sentences have main stress and information focus on the clefted NP. The information focus for the clefted element is always New and thematic, by virtue of its identifying function. This contradicts Firbas' (1970) claim that the clefted element is the rheme, to the extent that the notions of "what the sentence is about" are comparable in the two theories.

Halliday does not consider contextual motivation, although the specification of a separate identifying function gives a good basis for discussion. All cleft and RPC sentences have the identification function, but there is a difference between contextually unmotivated identification

(25) Grandpa's farm was a great place to spend a weekend... It was the <u>children</u> who loved the swamp above all. They couldn't understand why visitors never bothered...

and clefting where the "New" function is determined by the context, as in (26):

(26) I wish I knew who set the fire.

It was Jane who set it.

In contexts like (25), the Newness of the clefted element derives from its context-independent identification function. The relative semantic weakness of this type of operation is shown by sentences in which another element might be clefted without being contextually inappropriate:

(27) Grandpa's farm was a great place to spend the weekend... It was the swamp that the children loved above all. They couldn't understand why visitors never bothered...

Here the clefting does not fulfill a discourse function, but merely identifies the clefted element as a focus of interest.

This is never the case for contextually motivated clefting:

(28) I wish I knew who set the fire.
#It was the fire that Jane set.

Here the clefted element supplies information which is invited by the context, and clefting the Given information, fire, is inappropriate.

Halliday states that the copular be of clefts identifies the clefted NP with the one in the case of pseudoclefts (e.g. 29(c)), and with the full nominal in the case of simple clefts:

(29) (a) Peter is the one who likes pastels. (RPC)
(b) It is Peter who likes pastels.

(cleft)
(c) The one who likes pastels is Peter.
(pseudocleft)

Akmajian (1970), a generative grammarian, has proposed that since clefts and pseudoclefts "are synonymous, share the same presuppositions, and in general...can be used interchangeably" they should have the same deep structure. He argues that the pseudocleft should be taken as basic, with simple clefts derived through independently motivated Extraposition and It-replacement rules. The syntactic argument supporting his analysis is that verbal agreement patterns for the simple clefts are identical to those of pseudoclefts: while the main verb agrees with the surface "identified" noun (the one in the case of pseudoclefts and the full nominal for clefts), it agrees in person only with the identified noun of the cleft structure. Thus:

(30) (a) I am the one who likes tahini.

(b) *It is me who like tahini.

Since the deep structure of cleft sentences identifies the clefted NP with the one, the embedded sentence (e.g. "who likes tahini") is part of the identified.

These formal observations may, depending on one's theoretical leanings, be taken as support for Halliday's claim that the identifier is thematic (although it is not clear from Halliday's discussion whether the same applies to pseudoclefts such as 29(c), where the full nominal is in final position and the one is in initial position).

However, Firbas' (1970) claim that the clefted element is rhematic is also justifiable on the basis of its identification function: the clefted element is not only what the sentence is about (if in fact linear order can predict how such semantic judgements are made), but it is also a comment by virtue of its identification function. This is an interesting dilemma, since the acceptance of formal and functional criteria lead to different conclusions concering sentence theme.

To further complicate matters, the theme of <u>any</u> sentence can be construed as implicitly identifying the thematic element as what the sentence is about. Worse yet, in contexts where the speaker explicitly states what the sentence is about, that information is not always thematic, since it is not necessarily in initial position. Thus in 31, (c) is an appropriate sequel to either (a) or (b):

(31) (a) Let me tell you about Arnold.
(b) Let me tell you about what Arnold killed.
(c) He killed the pig.

In the context of (b), <u>he</u> is assigned thematic status because of its position, despite the fact that the sentence is "about" what Arnold killed. It therefore appears that the "intuitive" notion of theme is not always attributable to the initial element of a sentence.

A more satifactory analysis of (31) is in terms of information distribution. In the context of 31(a), sentence

(c) might contain two pieces of New information: both "killed the pig" and the identification of Arnold as the killer. On the other hand, (a)-(c) might occur in a larger context, where the fact that somebody killed a pig is Given; in that case, the only New information is the identification of Arnold as the killer. The pronoun he may or may not be in the intonation centre. Sentence (c) has unmarked focus, such that either killed the pig or the pig may be the New information, and this explains why it is also appropriate in the context of (b).

Clefting also functions to supply contextually relevant New information. In (31a'), it is presupposed that someone killed the pig, and the clefting serves to identify the culprit.

(31) (a') It was Arnold that killed the pig.

It is important to note that the presupposition would be Given information in a full context - that is, the sequence (a)-(c) must occur in a context where the fact that someone killed the pig has been mentioned or is otherwise obvious.

In (31b') it is given that Arnold killed something, and the clefting identifies the pig as the victim:

(b') It was the pig that Arnold killed.

The simple declarative (c) is thus seen to function in many different ways, depending on the context, and the notion of theme is unnecessary for a description of its different functions.

The thematic explanation, although unsatisfactory on other grounds, happens to predict which element is clefted in 31(a') and (b'), but again an analysis in terms of identification as new information is adequate. Sentence 31(a') has Arnold as "thematic", since the preceding context is "Let me tell you about Arnold". This clefting is informationally unambiguous: it may be used only in a context where it is given that someone killed the pig and only the identification of Arnold is New. The clefting indicates this informational prominence without recourse to theme. The clefting of the pig in (b') is also contextually motivated, providing information invited by the preamble.

It therefore appears that cleft sentences are most profitably analyzed as information focus phenomena, and that the notion of theme is poorly motivated and unnecessary to their description.

2.4 Focus and Presupposition in TGG

Chomsky (1971) has defined focus as the "phrase containing the intonation center of the sentence" (p. 203). Notice that this definition does not describe the semantic properties of focused elements in any useful way - any other arbitrary term could have been used for the stressed phrase in a sentence. However, Chomsky does state that the non-focal part of a sentence is presupposed, and this does have

implications for the semantic interpretation of non-focal information. Although it seems clear that information which is not presupposed by the speaker must be informationally New, Chomsky uses the less specific term "focused", presumably because Newness is a context-dependent term, and context cannot be accounted for in a sentence grammar.

The abundance of research on the nature of presuppositions (e.g. Garner, 1971; Hutchinson, 1971; Jackendoff, 1972; Keenan, 1971) is an interesting consequence of attempting to force a sentence-based theory to account for contextual restrictions on sentence form. One claim advanced in these studies is that a sentence can have a number of possible sets of prsuppositions. Strictly speaking, this means that isolated sentences are ambiguous, since a full analysis of the meaning of a sentence is claimed to require a representation of its presuppositions. In reality, of course, what is "presupposed" is Given information (in Halliday's sense), and the context serves to determine which items of information are "presupposed" by the speaker.

Chomsky's rediscovery of Halliday's notion of unmarked focus illustrates the difficulties with this point of view. He suggests that since the focus is an entire phrase, any constituent of that phrase is also a focus if it contains the stressed word. Thus, an isolated sentence such as (32) "has" (a), (b), (c), and (d) as foci, with (a'), (b'), (c')

and (d') as the corresponding presuppositions:

(32) Was it a man with a red shirt that he shot?

(a) a man with a red shirt
(a') he shot someone

(b) with a red shirt
(b') he shot a man

(c) a red shirt
(c') he shot a man who was wearing something

(d) shirt
(d') he shot a man wearing something red

However, given the preamble "That fellow over there just shot somebody", (32) presupposes (a') but not (b')-(d'). It should be clear that in actual speech situations, the focus-presupposition dichotomy is identical to Halliday's Given-New distinction.

Although he does not acknowledge it, Chomsky's analysis of the focus properties of dative sentences is based entirely on arguments for cases where one object NP is Given and the other is New. He claims that (33) and (34) differ in meaning because their appropriate answers are (35) and (36) respectively.

(33) Did John give the book to Bill?

(34) Did John give Bill the book?

(35) No, to someone else.

(36) No, something <u>else</u>.

Although this is true when <u>book</u> and <u>Bill</u> are Given in (33) and (34) respectively, these sentences do not differ in presupposition when both object NP's are New. Under these conditions, (37) and (38) are appropriate replies to both questions:

(37) No, he gave it to <u>Fred</u>.

(38) No, he gave him the <u>files</u>.

Since Chomsky's mechanical method of determining focus depends on pitch prominence, it cannot explain the constraints on the order of direct and indirect objects in sentences with falling intonation and no pitch prominence. In order to explain these constraints, Chomsky would have to further state either that "Given" and "New" are surface structure phenomena - an unlikely analysis, since they are determined by the semantic context and the intent of the speaker - or that they are marked in deep structure and trigger the appropriate movement rules.

Chambers (1970) followed the latter course, and attempted to revive the Standard Theory by proposing that the features [FOCUS] and [TOPIC] be inserted by the rules of the base component. The former would trigger transformations such as Dative Movement, which postpose constituents to the intonation centre (assuming "normal"

intonation), and the latter would trigger rules such as as Passive and Cleft, which prepose constituents.

This treatment is inadequate for at least four reasons. First, when both object NP's are New, they should be unmarked for focus. This would require that the rule be optional only when both object NP's are New. However, the grammar does not provide an "unmarked" feature value, and assigning the same value to both NP's as an ad hoc adjustment would not generate the necessary sentences. If both are marked [+FOCUS], the postposing rule will always apply and the underlying order will never surface. Conversely, if both NP's are marked [-FOCUS], the Dative rule will never apply and all unmarked sentences will have the underlying order. If it is claimed that even in the New-New case one of the elements is more prominent than the other for more subtle reasons (e.g. Andrew, 1974), then the obvious differences in information structure between the two types of contexts cannot be expressed. Second, even in the marked case, the feature [+FOCUS] is assigned arbitrarily by the base component, since it is optional. This means that although all sentences with an information focus are generated correctly, the known conditions under which [+FOCUS] is assigned are not made explicit. Third, differences in contextual motivation which govern the function of the clefted element, whether contextually motivated or simply identifying, are lost. In addition,

Chambers' analysis, like Chomsky's, cannot locate the focus in sentences which do not give pitch prominence to new information.

Jackendoff (1972) incorporated Chomsky's surface structure notions of focus and presupposition directly into the semantic component of his revised TGG. Possibly his most important contribution concerns the relationship between focus, stress, and intonation contours - a relationship which is more complicated than previous work suggests. He demonstrates that a sentence with two focused elements can fulfill two different "presupposition" functions, and that this is marked by differences in intonation. Thus:

(39) What about Fred? What did he eat? Fred ate the beans.

(40) What about the beans ? Who ate them ? Fred ate the beans.

The terminal contour on beans is falling in (39), which presupposes that Fred ate something and that Fred was not the only person who ate. In (40), the terminal contour is rising, and even out of context the answer presupposes that beans were not all that was eaten and that someone ate the beans. Although the location of foci can (sometimes) be determined through surface features, an adequate theory of focus would also have to specify the effects of presupposition and focus (or Given and New) on intonation.

In a similar vein, Lakoff (1971) proposed that an adequate grammar must specify the presuppositions, topic, and focus of each semantic structure. His argument against Chomsky's surface treatment of focus is based on sentences such as

(41) The tall girl left.

Lakoff suggests that Chomsky is wrong in asserting that focused information is not presupposed, since in in this case

> the semantic content of the focus is an assertion of coreferentiality...the new information is that the girl who was presupposed to have left is coreferential with the girl who was presupposed to be tall (p. 261)

Although this is correct, it is simply a restatement of Halliday's global definition of New, since "contrastive" stress can fulfill the identifying function.

Because they limit their attention to sentences as abstract, contextless entities, TGG accounts of focus and presupposition are less informative than either the Prague School or the London School accounts. Analysis of the role of contextual motivation in information focus is thus beyond the range of these theories.

2.5 Chafe: The Primacy of Meaning

It is natural that a linguist such as Chafe, who rejected the transformationalists' belief in the primacy of syntax, should become the most vocal American proponent of contextually-based studies. His model of language is comparable to those of Halliday and Fillmore, in that it attempts to show how semantic phenomena determine both the syntactic and the phonological forms of sentences.

In Meaning and the structure of language, Chafe devotes a separate chapter to the subject of New and Old information, stating that it is "of unusual importance to our understanding of how language works" (p. 210). Here, and throughout his later works, he takes a particularly strong stand on the semantic function of the phonological salience of New information: "higher pitch and amplitude quite evidently are related to an increase in the effectiveness of communication" (p. 213). Like Halliday, Chafe speaks of a "least marked" distribution of New and Old information, in which sentence-final nouns receive higher pitch, regardless of how much of the end of the sentence is New. Again, the generality of such a statement is limited by the existence of sentences having the falling contour discussed above.

Chafe's attempt to place the notions of New and Old into psychological perspective (Chafe, 1972; 1974) led him

to an analysis of the role of "consciousness" in real-time language processing. He states that the distinction between Old (later renamed Given) and New is based on a speaker's assumptions as to "what is in his addressee's consciousness at the time of speech" (1974, p. 111). That the speaker's assumptions impose "transitory constraints" on his utterances is demonstrated by pronominalization: a pronoun is used appropriately only when it is reasonable to assume that the listener has the referent in his consciousness, and that it is clear to him which of the grammatically possible referents is intended.

Chafe has also suggested that New and contrastive information have different semantic properties. He claims that sentences such as

(42) David emptied the box.

> imply a context in which there were several people who might have emptied the box...What is new, therefore, is not so much the semantic unit David, as the fact that the speaker selected David rather that some other possibility (p. 224)

In a later article (Chafe, 1976), he offers three criteria for determining whether a sentence is intended to be contrastive. First, the speaker must assume that his addressee shares an awareness of the "Given" (for example, that someone emptied the box). Secondly, the speaker must assume that the set of possible candidates for the contrast is limited, since an unlimited range of possibilities would

render the information simply New. Third, the element bearing the heaviest stress must be asserted to be the correct choice. Chafe suggests an operational test for contrastiveness: it must be possible to insert the phrase "rather than" (and an appropriate alternative known to the listener) after the New element, which he calls the "focus of contrast".

Both cleft and dative sentences can mark a contrast in a discourse. Consider (43):

(43) I couldn't decide whether to pour the last drink for Howard or for Bev.

(a) #Finally I handed Bev the bottle. (rather than Howard)
(b) Finally I handed the bottle to Bev. (rather than Howard)

(44) I wonder if it was one of Hermann's men that tied Roger to the stop sign.
Yes, it was Peter who did it. (rather than one of the other gangster's men)

When the New element is contrastive, it must appear in the cleft position for cleft and RPC sentences, and either in sentence-final position or in the intonation centre for dative sentences.

Chafe's observations make well-motivated claims about the role of psychological constructs such as givenness, newness and contrast in language performance. They do not rely on the questionable notion of theme, nor do they depend solely on intonational prominence or linear order as cues to

the locus of information focus. Rather, both linear order and phonoligical prominence are considered to signal the location of New information in a sentence. Such claims are amenable to empirical test, and will provide the basis for the experimental hypotheses advanced in Chapter Four.

2.6 Datives and Clefts in Context

The preceding analyses have suggested a functional view of datives and clefts which will now be reviewed briefly.

Dative sentences have either a marked or unmarked information distribution, depending on their intonation and stress patterns. In the unmarked case, the stress falls on the final NP, regardless of its syntactic function, and the sentence can have either New-New or Given-New as the information distribution for the two object NP's. In the former case, the order of the NP's is contextually unmotivated. If a preferred order exists, its semantic, rhythmic or "stylistic" basis is poorly understood, and a change in the order of the NP's does not affect the presuppositional status of the sentence. This seems to be the basis of the conventional treatment of Dative Movement as an optional rule (e.g. Akmajian and Heny, 1975). This is illustrated in (45):

(45) Patty just arrived last week.
(a) She sent a card to Gilles the day

she left.
(b) She sent Gilles a <u>card</u> the day she left.

When one of the NP's is Given and the other is New, the New NP may appear either in sentence-final position, or before the other object, so long as it is the intonation centre. In sentences without pitch prominence, linear order alone signals which NP is New, and the New NP must occur in final position.

Cleft sentences can have two information functions, one dependent on context and the other contextually unmotivated. If the sentence provides New information which is invited by the preceding discourse, that information must appear in the cleft position, and the rest of the sentence repeats the Given information.

Contrast is only one means by which a context can influence sentence form. As we have already seen, the Question Test is predicated on the fact that WH-questions invite an answer containing some information given in the question as well as the New information requested by the WH word. Thus any context which requests information about the relevant NP's, whether directly or implicitly, will restrict the form of both cleft and dative sentences. This was the case with (2) in Chapter One:

(2) "We don't know how the fire started..."
...It was <u>Jane</u> that set the fire.
...#It was the <u>fire</u> that Jane set.

A context may also request confirmation:

(46) There are rumours that you set the fire. Is that true?
Yes, I was the one who set it.

(47) I guess Mickey has already sold her property.
Yes, she sold her house to a developer.

or contradict:

(48) I really like the turtle soup that Arlene made.
It was Lois that made the soup.

(49) Did you send Jill the opium?

No, I sent her the heroin.

If a cleft sentence simply identifies one element as a focus of interest within the sentence without supplying invited information, then the clefting is said to be contextually unmotivated. The clefted element is New by virtue of its identification function, and the rest of the sentence must also be New. Unmotivated clefting may be viewed as an "emphatic" variation of the simple declarative, having no discourse function.

One consequence of this analysis is that contextually motivated clefts should be capable of undergoing reduction and deletion processes, since the Given information is contextually redundant. However, the New-New information distribution of motivated clefts should not be susceptible

to such processes. This prediction is borne out by the reduction in 50(b), and the impossibility of reducing or deleting that introduced me to the Marquis in (51):

(50) (a) "We don't know how the fire started..."
(b) It was Jane that did it. (started the fire)

(51) It was my brother that introduced me to the Marquis. We were at a party in Versailles...

The same constraints hold for dative sentences. While (47) allows the reduction shown in (52), neither 46(a) nor 46(b) can be further reduced.

(51) I guess Mickey has already sold her property. Yes, to a developer.

The next chapter reviews previous experimental research in the area of packaging phenomena and leads to the development of experimental hypotheses concerning the influence of context on the functions of dative and cleft sentences.

CHAPTER THREE

EXPERIMENTAL APPROACHES TO THEME AND FOCUS

3.1 Introduction

All formal treatments of packaging phenomena agree that theme and focus are independent semantic functions that can be assigned to an NP (as well as to other constituents), and that they are signalled by linear order and/or phonological prominence. Although the theme-focus distinction has thus far been based only on linguists' intuitions concerning what a sentence is about and which information is New, it is worthwhile to verify whether speakers in general can or do make such distinctions, either implicitly or explicitly in ordinary language use. The present chapter reviews a number of psycholinguistic experiments which explore the psychological viability of the notions of theme and focus.

It was seen in Chapter Two that the communicative function of sentence theme is not derivable from post hoc linguistic analysis. Suppose, for example, that a speaker utters the following sentence, intending all of its information to be New:

(1) Alistair introduced the lecturer.

Introspective analysis cannot reveal whether the speaker mentioned Alistair first because that concept arrived in his consciousness before the comment (introduced the lecturer) and was therefore processed and output more quickly, or whether his choice of theme fulfills an informational function - one which might be characterized by the proposition "The following is a comment about Alistair." In the latter case, processing ease might be overidden by considerations of what the speaker intends his addressee to take as thematic. The inclusion of thematic information in the semantic components of formal grammars suggests that the propositional interpretation is favoured by linguists.

Three kinds of methodolcgies have been adopted in attempts to resolve this indeterminacy. To study the problem from the speaker's point of view, one might manipulate the apparent topic of a discourse, and ask subjects to supply additional sentences in order to discover whether they place the topical information in thematic position. This could help establish the importance of theme in sentence production. From the listener's point of view, one might ask whether thematic information is decoded and stored along with the rest of the propositional content of the utterance, whether it marks the place in memory where the information is stored, or whether it fades quickly from

memory as do most details about the specific syntactic and lexical form of an utterance (e.g. Sachs, 1967; 1974). Paradigms which are neutral between the roles of speaker and hearer involve eliciting fairly direct judgements from subjects concerning what a sentence is about.

The same kinds of questions may be asked about focus information, and similar methodologies can be used to answer them. One would like to know whether the speaker's linguistic ability includes rules governing the syntactic and prosodic realizations of Given and New information, as shown by performance on a production task; whether the listener's sensitivity to contextual information is sufficient to allow him to reconstruct test sentences containing the appropriate focus information in a memory task; or whether both speakers and listeners can make consistent direct judgements about which kinds of sentences are focus alternates, and which differ in focus information.

Since the terms "theme", "focus", "topic", etc. have been used in different ways by different experimenters, the studies selected for discussion have been organized by methodological type. The significance of each experiment to the notions of theme and focus as discussed in the present work will be specified in each section.

3.2 Production Tasks

Carroll (1958) reports that when subjects were asked what an actor-subject had done in a staged event that they had just witnessed, they were likely to respond with active sentences using the actor as surface subject. However, when questioned about the acted-upon patient, there was an increase in the frequency of passive sentences with the patient as surface subject. Carroll suggests tentatively than "sentence-subject" (theme) might correspond to the figural component of a figure-ground relation; that is, that the thematic element should be construed as that which is most salient to the speaker in the encoding situation. This interpretation is compatible with the ease-of-processing hypothesis.

In a related study, Tannenbaum and Williams (1968) considered the effect of "conceptual focus" - roughly, the topic of discussion in a discourse - on their subjects' use of active or passive sentences to describe line-drawings of simple actor-action-patient situations, such as a train hitting a car. The subjects first read a six-sentence preamble which was either (a) about the actor (e.g. the train), (b) about the patient (e.g. the car), or (c) neutral (about neither the train nor the car). The sentences in each preamble were either all active or all passive, with the noun of interest either always surface subject or always surface object. The experimental subjects were pre-trained

on the active-passive distinction, and were told to describe the situations by using either active or passive sentences, depending on whether an A or a P appeared in the upper left-hand corner of the drawing.

Response latencies for active sentences were found to be shortest when each sentence of the preamble supplied information about the actor, and longest when each preamble sentence was about the patient; the reverse was true for passive sentences. This suggests that when speakers attempt to produce a sentence with a specific theme in mind, they are disposed to choose a sentence frame which places the thematic element in initial position, and, in accord with the ease-of-processing hypothesis, find it more difficult to describe the situation by means of a sentence which has the thematic element in final position.

However, this experiment displays an interesting anomaly which has not been accounted for in the literature. Although Tannenbaum and Williams were careful to balance the effects of preamble voice by including passages in which the "conceptual focus" was developed by means of passive sentences (e.g. An efficient means of transportation is provided by trains), this means that a passage about trains can be composed entirely of sentences in which trains is in non-thematic position. The difficulty cannot be resolved by a post-hoc decision that passive sentences have the surface object as theme, since one of the conditions under which

passive sentences with the "focused" element as surface subject were likely to be produced involved preambles composed entirely of passive sentences having the patient as surface subject. Clearly these observations pose serious difficulties for those linguistic theories which claim that thematic elements can always be identified on the basis of linear order.

An alternative explanation for Tannenbaum and Williams' results rests on the fact that the repetition of the "conceptual focus" would render it Given, whether it occurred in surface subject or object position. The results can then be readily explained by the tendency for speakers to place Given information before New. Since both active and passive sentences (which have similar intonation contours) were used, this reinterpretation in terms of information distribution (focus) is independent of phonological phenomena, and stands as evidence that, at least in this highly structured experimental situation, speakers tend to choose active and passive sentences on the basis of information focus. In retrospect, Carroll's (1958) results can be interpreted in the same way. By asking his subjects questions such as "What happened to the blocks?", Carroll motivated answers in which blocks was Given information. The tendency toward Given-New order predicts that sentences with blocks as subject (e.g. The blocks were dropped by the professor) should be more frequently used as

responses in the case cited that when the question is "What happened with the professor?" Sequences such 2(a)-(b)

(2) What happened with the professor?

(a) #The blocks were dropped by the professor.
(b) The professor dropped the blocks.

show how contextual motivation of information focus can affect the appropriateness of active and passive sentences. Moreover, passives can occur in non-motivating contexts, in which case the speaker may choose freely between the active and the passive, and the semantic effect of this choice is as poorly understood as the low-level semantic effect of dative position in non-motivating contexts. Consider:

(3) Do you have anything interesting to tell us?

(a) Columbus discovered America in 1492.
(b) America was discovered by Columbus in 1492.

In (3), neither the active nor the passive form approaches the inappropriateness of 2(a). The notion of theme is thus unnecessary for the description of active and passive sentences, and an explanation in terms of contextual motivation, information focus, and intonation would provide a more adequate - and testable - account of their use.

3.3 Memory Experiments

The fact that a large number of experiments on theme and focus employ memory paradigms merits a discussion of

some general theoretical issues surrounding the use of memorial techniques in psycholinguistic research. First, it must be recognized that researchers who adopt memorial techniques work under the tacit assumption that the semantic effects of theme and focus are powerful enough to survive decay and interference. Thus Fillenbaum (1970; 1973) has argued that memorial tasks can be insensitive to certain aspects of speakers' linguistic abilities, and data from such studies must be interpreted with caution.

For example, Fillenbaum (1970) criticizes Clifton and Odom's (1966) study in which recognition confusions between affirmative and negative questions (e.g. "Did you buy the paper?" vs. "Didn't you buy the paper?") were interpreted as supporting Katz and Postal's (1964) linguistic analysis, which assigns the same deep structure (and hence the same meaning) to both types of sentences. Fillenbaum devised three "direct" tasks for his subjects, eliciting paraphrases, equivalence judgements, and predictions of speaker expectations for the two types of sentences, and found a complex pattern of responses that could be accounted for by neither Katz and Postal's nor Clifton and Odom's work.

Clifton and Odom's technique was certainly inadequate for drawing conclusions about the depth and breadth of speakers' intuitions about the meaning and use of sentence types. Like other researchers of that period, (e.g Koplin

and Davis, 1966; Marks and Miller, 1964; Mehler, 1963; Miller & McKean, 1964) Clifton and Odom used isolated sentences with overlapping semantic content as stimulus items; certainly such materials promote an undue amount of interference which would not occur in normal language processing, and the results should not have been interpreted as revealing the most detailed semantic properties of such sentences. It is quite reasonable to suppose that under more natural conditions, particularly when the use of affirmative or negative questions is contextually motivated, a more sophisticated memorial technique should find reliable discrimination between the two sentence types.

Fillenbaum (1973) also points out a more insidious problem with memorial techniques: in any experiment designed to test hypotheses about linguistic processing, the experimental effect may be confounded with unknown properties of the memory system. This point was brought home soundly to psycholinguists when James (1972) demonstrated that the results of several experiments (see below) which found a tendency for surface subjects ("theme") to be recalled better than surface objects were due to a lack of control for the imagery value of subject nouns: surface subject nouns are more likely to be concrete, and concrete nouns show a recall advantage in many kinds of memory tasks; therefore, in any random sample of sentences, subject nouns should be expected to show a recall advantage

over object nouns. Fillenbaum warns that other unknown memory effects might in principle be found in any such experiment, and that memorial techniques are therefore to be avoided.

On the other hand, the fact that memory is a semantically-based system is too important to be overlooked by those interested in linguistic semantics. For example, if the notions of theme and focus are psychologically relevant, it is important to know whether incoming thematic or focal information is regularly processed and stored, or whether, for example, the listener discards all information about linear order and intonation features as quickly as he discards other semantically non-significant syntactic and lexical information. Memory tasks provide a practical test for semantic significance: if a hypothetical linguistic phenomenon such as theme is never reliably remembered, then it is difficult to see in what sense it can be termed "semantic". Memorial techniques can help solve interesting psycholinguistic problems, so long as they are carefully chosen so as to be appropriate to the phenomenon under investigation. Their use involves no more risk than any experimental technique in which unexpected confounding variables (e.g. artifactual response strategies) might be at work.

Research by Sachs (1967; 1974), which was not specifically designed to investigate theme and focus, will

be described here in some detail, both because her experimental paradigm is that used in the experiments of Chapter Four, and because her results do have implications for the interpretation of the notions of theme, focus, and contextual motivation.

Sachs (1974) was interested in the retention of syntactic and lexical ("surface") information, compared to memory for meaning. In one part of the study, the subjects listened to recorded passages, each of which contained a target sentence which was tested in a recognition task after either 0, 20, 40 or 80 syllables of interpolated text. The test sentence was either identical to the target, or altered in one of four ways: lexically changed through substitution of a synonym for one of the content words; semantically changed (e.g. through reversal of actor and patient roles); transformed from active to passive or vice versa; or altered syntactically in a way which would not change the meaning (e.g. through particle movement or dative movement). In all cases, both the target and test sentences could have appeared in the passage without disturbing the coherence of the text. The subjects judged each sentence as either "changed", or "identical" to the original, and rated their confidence on a 1-5 scale; correct responses were assigned the positive value of the confidence score and incorrect responses received the negative value.

Sachs found that semantic changes were well recognized

at all delay levels, while the non-semantic changes were poorly recognized when the delay was 20 syllables or greater. The poor recognition of active-passive and dative position changes at first seems to suggest that neither thematic nor focus information is semantically significant to the listener. However, the fact that either version of each test sentence could have appeared in the passage means that the syntactic forms were contextually unmotivated, and poor recognition should be predicted under those conditions. It remains to be seen whether changes which alter contextually motivated theme and focus would be better recognized.

Sachs' results do not support the linguistic analysis of theme as a semantic feature of all sentences, since in the case of actives vs. passives, thematic information was not interpreted and stored by the subjects, and was forgotten as quickly as other surface information. The fact that this is true for contextually unmotivated sentences leads one to conclude that such sentences cannot be "about" the initial NP in any useful sense. For example, the sentence John ate my pizza informs the addressee about John, but it also informs him about the fate of the pizza. Only if John is already the topic of discussion in the wider discourse context does it become clear that the sentence is about him. But this "topic of discussion" corresponds in part to Chafe's (1976) notion of Given information, and a

separate definition of theme is unnecessary.

Similar reasoning can be applied to the results for dative sentences. Since Sachs did not report that changes in dative position were better recognized than other formal syntactic changes, one may conclude that the contextually unmotivated linear order of the object NP's had little semantic significance. It remains to be seen whether Given-New information distribution is remembered; if so, and if subjects choose dative position on that basis, then changes in object position should be well recognized under those circumstances.

Although Sachs' analysis of the recognition confidence scores gives valuable information concerning the relative recognition accuracy for the various kinds of changes, the conclusions she draws on the basis of per cent correct responses are unfounded. Sachs subtracted the false alarm rate ("changed" responses to unchanged sentences) from the hit rate ("changed" responses to changed sentences) for each type of change. For example, at the 40-syllable delay, there was 87% correct recognition of semantic changes. Rather than suggest that semantic information is reliably stored 87% of the time, Sachs subtracted the false alarm rate of 46%, to obtain the "amount above chance": 41%.

Despite the fact that one would like to correct for guessing, Sachs' procedure does not represent a suitable

model of the recognition process. Subtracting the false alarm rate from the hit rate assumes that whatever caused the subject to respond "changed" to ID sentences (e.g. differences in intonation or rhythm; confusion as to the nature of the task when no change exists) is not only operative, but also more salient than the actual semantic change in 46% of those sentences.

The difficulty lies in the fact that the recognition task is in fact qualitatively different for ID and for semantically altered sentences. Although guessing might account for some of the correct responses, this would imply that the subject had no other information on which to base his judgement. That there is no appropriate method for detecting guessing behaviour becomes particularly bothersome when correct recognition is near 50%, which is the figure that one would expect if all subjects responded randomly (e.g. if they filled out the response sheets without listening to the stimulus tapes). Unfortunately, the same figure would be expected if the subjects responded correctly to half the sentences on the basis of memory for the surface form of the sentences, and were deceived by the other 50% because they had the same meaning as the target. Obviously, there are an infinite number of possibilities in between, e.g. 30% correct, 30% wrong due to semantic similarity, and 40% guessing, of which 20% would be correct. What Sachs did not take into account is the "semantic integration" effect

(e.g. Bransford & Franks, 1972), which predicts that for non-semantic changes and sufficient interference or decay, all responses should be "identical". In order to completely represent the composition of any one score in a recognition task, one needs to specify three variables: per cent correct due to residual "surface" memory, per cent wrong due to the semantic integration effect, and per cent guesses, of which one half would be hits and one half would be misses. Since there is little reason to expect that a large number of responses should be based on the subject's not having heard the stimulus sentence, it is unlikely that the false alarm rate is a good estimate of guessing behaviour. Rather, a score of 50% is likely to be a fair reflection of the amount of "surface" memory left at the time of testing. It follows that if Sachs had used much longer delays, she would have found much lower scores. However, the instructions to attend to wording probably place a lower limit on the recognition scores. On the other hand, the relative scores for the various kinds of changes do have theoretical significance, for they suggest that the retention functions for semantic and non-semantic information are different.

As noted in the general discussion of memory paradigms, several experimenters have reported a recall advantage for surface subjects of isolated sentences. Coleman (1965) presented sets of six sentences on slides, then gave his subjects 90 seconds to write down as much as they could

recall. Recall accuracy was found to decrease in the order surface subject - surface object - verb, for both active and passive sentences. Clark (1966) had his subjects write down as much as they could recall after reading groups of 10 active sentences of the form the ADJ NOUN VERBed the NOUN; his results confirmed those of Coleman (1966). Similarly, Horowitz and Prytulak (1969) collected protocols from one group of subjects who were asked to supply all but the subject noun, the verb, or the object noun of simple declarative active sentences; another group was given a visual-presentation recall task using the sentences produced by the first group, and the usual order of recall accuracy was obtained. Clark and Card (1969), in a study of the recall of comparative sentences, found that surface subjects were recalled best, claiming that

> Although the theme might be remembered well because it occurs first in these sentences, there is an excellent alternative explanation. Semantically, the theme is the focus of attention in the sentence - what the sentence is about - whereas the other term is not. (p. 552)

In spite of such seemingly strong experimental evidence for the semantic significance of theme, James (1972) has demonstrated that the recall advantage for subjects in all the above experiments is due to a lack of control for inherent recall differences between subject and object nouns. Hall (1965) has noted that transitive verbs are more likely to take an animate subject than an animate object,

and Clark (1965) reported that 82% of the sentences provided by subjects in a production task similar to that of Horowitz and Prytulak (1969) had animate subjects, compared to only 27% animate objects. Since animate nouns are concrete, and since concrete nouns are superior to abstract nouns in many memory tasks (Paivio, 1969), James predicted that the recall advantage for subject nouns would vanish if subject and object nouns were equated for concreteness in each stimulus sentence. His recall experiments showed no reliable difference between the recall of surface subjects and objects under such control conditions. Thus, linguistic analyses to the contrary, "thematic" elements are not viewed by speakers as semantically salient, at least in isolated sentences. The animacy effect suggests that in the absence of an informationally motivating context, speakers choose active or passive sentences so as to preserve the favoured animate-inanimate order, and this hypothesis might be tested by means of a production task.

In a combined memory and production task, Turner and Rommetveit (1968) attempted to influence the voice in which children recalled active and passive test sentences by presenting pictures of the actor, the patient, or the total sentence content, both at the time of storage and at recall. They suggested that their procedure would vary the child's "focus of attention", and predicted that when either storage or retrieval pictures depicted just one element, the

sentences should tend to be recalled with that element as surface subject, whether or not this involved a change in voice. That hypothesis was supported, though the effect was much stronger for retrieval pictures than for those presented at storage.

Turner and Rommetveit do not discuss the implications of their work for formal linguistic theory. However, their results may be interpreted in the same way as those of Carroll (1958) or Tannenbaum and Williams (1968). First, it should be recalled that Sachs' (1974) study showed that the structural features of active and passive sentences are quickly lost from memory, and only the basic propositional content is retained. Whenever a single element of the original sentence is presented pictorially at recall, that element should be interpreted as Given, and the subjects should reconstruct a sentence having the remembered semantic content, but with the Given element in initial position. This explains the powerful effect of "focus of attention". The slight effect of the presentation of a partial scene at storage is less easily explained, but presentation of a picture at the same time as the sentence might be viewed as a repetition of that information. It is thus not surprising that the effect of the storage picture should be so much weaker. Moreover, the idea that the theme functions as a focus of attention is contradicted by Hornby's (1974) finding that subjects tend to ignore misrepresentations of

Given (initial, thematic) information more often than misrepresentations of New information.

Perfetti and Goldman (1974) have added greatly to the understanding of
sentence-theme in their discussion of the discourse function of thematization. In their study, they first replicated the finding that theme has no memorial salience in isolated sentences by conducting a free recall and a prompted recall experiment using isolated sentences as stimuli. In a third experiment, the same stimuli occurred as final sentences in short narrative discourses. Each sentence was presented to different subjects in one of two different contexts, depending on whether the surface subject or object of the target sentence was also the "theme" of the discourse in which it appeared. "Thematization" in this study was accomplished not through frequent mention of the word of interest (as was the case with the rather unnatural stimulus passages used by Tannenbaum & Williams, 1968), but simply by having the paragraph provide more information about either the subject or the object NP, using either the full NP, alternative designations, or pronouns. For example, for the target sentence The serfs rebelled against the baron, the subject-theme passage gives several details about the lives of the serfs, mentions once that they suffered under the rule of a baron, and concludes with the target sentence, which was underlined on the subjects' stimulus booklets.

The object-theme paragraph gives biographical information about the baron, and mentions once that he had problems with his serfs. Each subject read 12 such passages, and was then asked to write as much of the underlined target sentences as he could recall, given the subject or object as a prompt word. It was found that the subject noun was equally effective as a prompt whether it or the object noun had been "thematized". However, the object noun was substantially less effective a prompt when it had not been the theme of the paragraph.

Perfetti and Goldman's interpretation of these results has several interesting consequences for the notion of theme. First, contrary to linguistic hypotheses, it seems that not every sentence has a thematic element. Isolated sentences were shown in the first two experiments to exhibit no free or prompted recall advantage for subject NP's, and Sachs' (1974) finding of poor recognition of active-passive changes in non-motivating contexts still stands. Perfetti and Goldman's results are relevant only for sentences which contain an element which is also the "theme" of the entire discourse. They state that the better prompt effectiveness for subjects under these conditions is related to the fact that

> It is the normal state of affairs that the first noun of a sentence is the "topic" of a <u>discourse</u>. (p. 78, emphasis added)

Notice, however, that this is not an accurate

characterization of previous analyses, which all state that the theme is what the individual sentence is about, and make no reference to discourse effects. The authors go on to explain the consistent prompt effectiveness of subject nouns (whether or not they contain discourse-thematic information) as reflecting the fact that "the syntactic subject is normally the theme of a sentence " (p. 78, emphasis added), while "only special discourse features thematize the object".

Despite their valuable insight concerning the sentence- and discourse-level functions of thematic information, Perfetti and Goldman use the term ambiguously. Their explanation implicitly invokes a frequency model of theme assignment: speakers recall subjects better that objects because they rely on analogy to sentences which have a discourse-independent sentence-level theme. But since the authors themselves show that in isolated sentences the notion of theme has no psychological validity for the listener, this line of argument is fruitless. Although no alternative explanation can be offered here, it should be noted that the discourse-thematization effect is an instance of contextual motivation and bears further investigation under various kinds of contextual manipulations.

Hornby (1971) presented subjects with 16 pictures depicting agent-action-patient situations (e.g. a woman painting a fence), and simultaneously presented tape

recorded sentences describing the pictures. Half the sentences were pseudoclefts, including four pseudocleft subjects and four pseudocleft objects, and the other half were clefts, half clefting the subject and half clefting the object. Sixty seconds after all pictures were presented, the subjects performed an oral recall task, cued by the original pictures. It was found that errors in syntactic form most often preserved information focus; for example, a cleft-subject sentence was more likely to be mistakenly recalled with a pseudocleft subject than with a cleft or pseudocleft object. Further, when simple active or passive sentences were given in place of the original, they were more likely to have the originally focused element as surface subject than as surface object. Evidently, the memorial salience of cleft position is much stronger than that of sentence theme, and information focus does seem to qualify as a semantic phenomenon.

3.4 Direct Procedures

Hornby (1972) investigated speakers' concepts of surface subject, logical subject, theme, and "psychological subject" in an experimental procedure which required direct judgements of what various sentences were "about". The subjects were shown pairs of line drawings, each depicting a human actor performing an action on an inanimate patient. In each pair, the actors and patients differed, but the

action was identical. At the same time, the subjects heard a sentence which described that action, but used the agent from one picture and the patient from the other. For example, if one picture showed an Eskimo building an igloo, and the other showed an Indian building a teepee, the test sentence would describe an Indian building an igloo or an Eskimo building a teepee. Each group received a different syntactic variant of each sentence: active, passive, cleft agent, cleft object, pseudocleft agent, pseudocleft object, or stressed agent. The response measure was the frequency with which the picture containing the agent or the patient NP was selected for each sentence type.

Hornby found that neither the surface subject nor the logical subject was consistently chosen, and that the picture depicting the initial NP was most often chosen in only four of the seven sentence types: active, passive, pseudocleft agent, and pseudocleft object. Hornby explains the anomalous results for initial cleft and stressed NP's as revealing the subjects' tendency to interpret elements with those special structural or intonational markers as conveying New information. The fact that the subjects were able to make such judgements without the aid of a context is consonant with the analysis of cleft sentences provided in Chapter One, which specifies that even when no context is provided, the information in initial position is treated as New.

In a later study, Hornby (1974) hypothesized that subjects would be more likely to overlook discrepancies in Given information than in New information. In the experiment most relevant to the present work, subjects heard a cleft or pseudocleft sentence, followed immediately by very brief (50 msec) presentation of a picture which misrepresented either the focused (New) or non-focused (Given) information. For example, the sentence It was the girl that was petting the cat might be followed by a picture of a boy petting a cat, or of a girl petting a dog. The task was to respond "true" or "false", depending on whether or not the picture matched the information contained in the test sentence. The subjects made fewer errors when the clefted information was misrepresented, which supports the hypothesis that speakers tend to accept the validity of linguistically marked "presupposed" (Given) information, and to attend more carefully to the "focused" (New) information. Again, the notion of theme is unnecessary in accounting for these results, since cleft and pseudocleft sentences have the focused element in initial and final position respectively. Taken together with the findings of the 1972 study, these results strongly favour the view that a sentence will be judged to be "about" whatever the listener assumes is Given, and the linear-order definition of theme is not only erroneous, but superfluous to any theory which contains a notion of information focus.

In a study of linguistic paraphrase, Fletcher (1973) notes that the criteria for defining meaning equivalence have become increasingly stringent in recent years. He proposes a three-way partition of semantics, to include (a) the semantics of content (Sc), comprising the meanings of individual lexical items and their functional relations within the sentence; (b) the semantics of mode (renamed "semantics of type" (St) by Baker, Prideaux & Derwing, 1973), which accounts for the semantic import of syntactic patterns such as declarative, interrogative, or imperative sentences; and (c) the semantics of discourse (Sd), which involves the semantic properties of a (linguistic) discourse context which might restrict the range of possible surface realizations of a particular conjunction of Sc and St.

Fletcher used the Question Test to study the effects of Sd on appropriateness judgements for members of the cleft sentence family. His subjects were presented with pairs of sentences, one a WH-question, and the other an answer providing the requested information in either focal or non-focal position. The subjects were asked to judge whether or not the answer was a suitable response to the question.

Fletcher found significant subject variation in this task, and used a hierarchical groups analysis to isolate three subject strategies. The largest group of subjects consistently chose as appropriate answers the cleft,

pseudocleft, or reverse pseudocleft sentences which focused the New information requested by the WH word in each question. A smaller group responded in the predicted manner only to the cleft and reverse pseudocleft sentences, while a third group did not attempt to preserve focus at all.

The finding of such variation in speakers' intuitions is an embarrassment to any formal linguist who claims that his rules have general psychological validity. Thus, one cannot rely on linguistic analyses to provide a comfortably solid basis for choosing stimulus materials in studies which test general properties of information focus (e.g. retention interval, comprehension time, etc.), since over half of Fletcher's subjects did not view the pseudocleft sentence as a focusing device.

Millar (1976) had his subjects supply similarity ratings for cleft, pseudocleft, and reverse pseudocleft sentences which were paired with sentences having contrastive stress on one constituent. It was expected that pairs which stressed and clefted the same NP would be judged more similar than those which stressed and clefted different NP's. Like Fletcher, Millar found that the largest group of subjects treated all varieties of cleft sentences as focusing devices, as evidenced by their rated similarity to the corresponding contrastively stressed sentences, and that one subgroup did not consistently treat pseudocleft sentences as focusing devices. Furthermore, the former

group did not appear to treat the pseudocleft construction as what Millar terms an "emphasis" device; that is they judged pairs of sentences which stressed and pseudoclefted the same element to be just as similar as pairs consisting of a pseudocleft and an unstressed, unclefted sentence. The third group was distinguished by the fact that the subjects did not consider any of the cleft sentences to meet the "emphasis" criterion.

Although such results appear to corroborate those of Fletcher, Millar cautions that both his and Fletcher's subjects may have adopted artifactual strategies in performing these tasks. One source of difficulty that might be investigated is that Millar's subjects did not have a discourse context in which to judge the cleft sentences. Since clefting may or may not be contextually motivated, the subjects would have been able to choose either the identifying function, which is an independent St phenomenon that does not mark a specific ccntrast, or the information focus function, in which case a suitable (contrastive) context would be assumed. This would explain the fact that the third group found all members of the cleft sentence family to be similar to unstressed sentences, which do not overtly mark a contrast. Further, since one group did not view pseudocleft sentences as focusing devices in both Fletcher's and Millar's experiments, it is conceivable that speakers prefer sentences of the form X was the one who...

for the identification function. These hypotheses are speculative, and as Millar suggests, further study is needed.

Andrew (1974) has suggested that since sentence theme and information focus are both matters of semantic prominence, a useful direct experimental procedure is to ask subjects to rank words "according to their importance to the meaning of the sentence" (p. 163). The basic stimulus materials in her experiment were simple dative sentences of the form human agent - action - inanimate patient - human recipient (i.e., subject - verb - direct object - indirect object). These sentences were varied systematically by voice, dative position, and stress (either "normal", or contrastively stressed on the subject noun, the verb, the direct object, or the indirect object), yielding 20 distinct types ranging over four different semantic contents. The subjects ranked the "importance to the meaning" of the four major lexical items, first individually, then in pairs, and finally in triples. As expected, both linear order and contrastive stress were found to be significant factors in the judgements of importance. In general, rated importance decreased as a function of left-to-right order. However, this was complicated by the fact that contrastive stress on an element increased its rated importance, although the effect decreased in magnitude in the same manner as the linear order effect. For example, stressing the surface

subject of an active sentence resulted in higher rated importance relative to the unstressed case, while stressing the last NP resulted in a split in the ratings, such that the initial and the final stressed elements were assigned rank 1 by nearly equal numbers of subjects. Essentially the same pattern of responses was observed for the rank ordering of pairs and triples.

Andrew claims that her findings have important implications for both linguistic and psycholinguistic theories of theme and focus. First, the linear order effect is interpreted as "a semantically significant aspect of passivization" (p. 137), since in active sentences the agent and patient received the highest and lowest ranks respectively, while interchanging their positions through passivization resulted in a reversal of this rating. This is seen to conflict with the information interpretation of linear order proposed by Chafe (1970), in which sentence-initial position in simple declaratives is reserved for Given information, while New information is found in sentence-final position. On the other hand, the results seem to support Tannenbaum and Williams' (1968) study of "focus of attention", which was interpreted in the present study (3.2 above) as evidence for the Given-New hypothesis.

The results for dative position are equally surprising, since the Given-New strategy predicts higher "importance" ratings for the final NP, if the subjects assumed a

motivating context, or no difference in importance, if both were assumed to be either Given or New. Andrew therefore criticizes Chafe's (1970) suggestion that dative position is semantically significant only when an object NP is front-shifted through passivization. She does not consider his later article on language and consciousness (Chafe, 1972), whose general orientation implies, contrary to Andrew's results, that the Given-New order should hold for dative position in both active and passive sentences.

Andrew concludes that "Halliday's type of focus theory is the most promising" (p. 152), but that his information focus system must be revised so that only contrastively stressed elements are treated as focal (rather than predicting sentence-final focus under normal intonation), and the notion of theme should be extended to account for the regular decrease in importance as a function of linear order.

Andrew's theory of focus constitutes a challenge to all others discussed thus far, and especially to the position adopted in the present study, that the only documented notion of semantic salience as a packaging phenomenon is the Given-New distinction. But if Andrew's claims are to be refuted, how can one account for her experimental results? One plausible explanation is that the powerful linear order effect reveals nothing about "how the message is sent" (Chafe, 1976, p. 28), but only about the way in which the

subjects viewed the actual situations described in the test sentences while performing the task. Since the subjects were asked neither what the sentence was about, nor which information was New, they may have adopted an image-building strategy in evaluating the "importance to the meaning" of each item. It would follow from this that the first word in a sentence should be judged most important, since it provides the first piece of information used in constructing the image, and that each additional lexical item should be viewed as providing additional information to help complete the image. The concreteness of the nouns and imageability of the verbs used as stimuli would encourage the adoption of this strategy. Under this interpretation, the split in responses for contrastively-stressed sentence-final nouns can be attributed to the fact that accepting stressed words as important constitutes a change in strategy away from image-construction and towards responding to contrastiveness. The surprising fact that only half the subjects considered sentence-final contrastive NP's as most important can thus be accounted for without contradicting the Given-New hypothesis.

The image-construction hypothesis could be tested by having a very large number of subjects perform the task with a small number of sentences and a short response interval, so that the data would be more likely to reflect natural processing, before artifactual response strategies are

developed. A post-experimental questionnaire designed to reveal subject strategies would have been a useful addition to Andrew's study.

3.5 Summary and Hypotheses

In this chapter it has been argued that there is no evidence supporting the assumption that every sentence has a psychologically salient "theme", identifiable on the basis of linear order (sentence-initial position) and indicating what the sentence is "about". Many experiments (e.g. Sachs, 1967, 1974; James, 1972; Perfetti & Goldman, 1974) show that listeners do not store thematic information, since they do not notice changes in sentence form which move the "thematic" NP from initial position. Studies purporting to demonstrate the use of theme by subjects in production tasks (e.g. Carroll, 1958; Tannenbaum & Williams, 1968; Turner & Rommetveit, 1968) were reinterpreted as evidence that speakers tend to place Given information at the beginning of the sentence and New information at the end, unless special syntactic or prosodic markers of New information are used. Finally, Hornby's (1971, 1972, 1974) studies show not only that native speakers do not always consider sentence-initial NP's to be what a sentence is about, but also that the distribution of Given and New information in all types of cleft sentences is remembered better than semantically non-significant features of surface structure.

Chapter Four describes two experiments based on the Given-New strategy and the notion of contextual motivation. Experiment 1 was designed to discover whether the memorial salience of cleft focus might vary as a function of manipulations in the context in which they occur. On the basis of the linguistic analysis of Chapter Two, it was hypothesized that although contextually unmotivated clefts do convey New information by virtue of their identification function, the semantic prominence of clefted elements should be even greater when contextual motivation is introduced. Since it is possible to change the focus of an "identifying" cleft sentence without destroying the coherence of the discourse, recognition of such changes should be poorer than for focus changes which place Given information in the focus position.

In Experiment 2, the data base for Sachs' (1967, 1974) report that dative movement is not memorially salient was extended by testing dative sentences in both motivating and non-motivating contexts. It was hypothesized that unmotivated dative position should not be remembered, but that changes in the linear order of the surface objects should be recognized on the basis of memory for which information was Given, and which was New.

CHAPTER FOUR

THE EXPERIMENTS

Experiment 1

Method

Subjects. The subjects were 54 student volunteers, 12 male and 42 female (mean age 25.8 years). Thirty-six were enrolled in an introductory linguistics course at the University of Alberta, and 18 were summer bursary students studying French at College Universitaire St. Jean. All were native speakers of English and none had formal training in syntax. Six subjects were assigned at random to each of nine test groups.

Stimulus passages. The 28 stimulus passages were based on newspaper reports, novels, and factual essays. There were two warmup passages, eight filler passages, and 18 "experimental" passages containing sentences relevant to the research hypotheses.

Three versions of each experimental passage were

prepared, with 20, 40, or 80 syllables of intervening material following the target sentence. The target sentences were all simple declarative clefts or reverse pseudoclefts (RPC's) with transitive verbs and clefting performed on either the subject or the object NP. Pseudoclefts were not used, since there is evidence (Fletcher, 1973; Millar, 1976) that many speakers do not treat them as focusing devices. The subject and object nouns were equated for concreteness, either both high (over 6.00), or both low (under 2.67) on Paivio, Yuille and Madigan's (1968) list. All were preceded by a definite article or by a demonstrative or possessive adjective. Other modifiers were avoided where possible, although context sometimes required the addition of a sentence adverbial or a conjunction.

The experimental passages were further structured according to whether the semantic context motivated clefting one NP rather than the other. Nine of the passages had motivating contexts (CM), such that altering the sentence so as to place the Given NP in cleft position and the New NP in non-cleft position would be inappropriate. The other nine passages had non-motivating contexts (CN), and were contrived to allow clefting of either NP. In these sentences, clefting served to "identify", in the context-independent manner described in Chapter Two. The appropriateness judgements were checked against the

intuitions of two linguists and two naive speakers. Sample passages are presented in Appendix A.

Three test sentences were prepared for each experimental passage, one subject to experimental control, and two distractors. The first test sentence, whose distance from the target was controlled by varying the amount of intervening text, was then written in three forms, either identical to the original (ID), focus-changing (FC), or focus-preserving (FP). The FC sentences were of the same cleft type as the target, but involved a change from subject to object focus or vice versa. The resulting sentence was always grammatical, but inappropriate according to the information distribution of the discourse. The FP sentences involved a change in the cleft type only; e.g. cleft-subject targets were changed to RPC-subject for the test. The ID sentences were included to provide exemplars of unchanged sentences for the recognition task, but were not analyzed, for the reasons outlined in Section 3.3. The two distractor sentences for each passage were either unchanged, or arbitrarily altered either lexically, syntactically, or semantically.

The filler passages were similar in content to the practice passages, but all three test questions were distractors. Several contained cleft or RPC sentences which were not tested.

A different set of stimulus materials was prepared for each of the nine groups, with each passage occurring once per group in one of its nine test forms (three levels of post-target delay, D, crossed with three recognition test types, T). The presentation order of the experimental passages was randomized for each group, with the filler passages appearing in every third position.

Response booklets. The three-page response booklets had passage numbers down the left-hand margin. For each passage, the test sentence numbers 1-3 were followed by the words IDENTICAL and CHANGED, followed by the numbers 1-5 for confidence ratings. The columns of ratings were labelled "low confidence" on the left and "high confidence" on the right. The warmup passages were labelled A and B, and two extra passage numbers were included to prevent an "end-spurt" effect.

Procedure. Since live oral presentation was used, the experimenter rehearsed the passages before testing in order to achieve a consistent presentation style. The target sentences were pronounced with neutral falling intonation and non-contrastive sentence stress on the focused NP.

Subjects were tested in groups of six in 45-minute sessions. They were instructed to listen carefully to the passages in order to be able to recognize all changes in wording, even when this did not affect the meaning. They

were also instructed not to circle CHANGED if that response was based only on perception of changes in rhythm or intonation. (Complete instructions are reproduced in Appendix B).

After hearing the instructions, the subjects worked through the practice passages. The passage number was read before each test segment, and the test phase was marked by a brief pause followed by the number "one" to signal the start of the first test sentence. Subjects were allowed seven seconds to respond to each sentence by circling the words IDENTICAL or CHANGED and a confidence rating on the response sheet. The correct responses for the warmup passages were discussed in detail in order to establish the fact that many kinds of changes would be encountered, and that some changes did not affect the meaning of the sentences.

Post-test interview. After completing the task, the subjects were asked whether they could guess the purpose of the experiment, and whether they thought that any particular kind of sentence stood out as being unnatural or remarkable in any way. The experimenter then read six of the experimental target sentences and asked whether anyone had noticed during the course of the experiment that they constituted a class of recurring types.

Scoring. The score for each response was based on correctness and the confidence rating. Correct responses

were assigned the positive value of the confidence rating, and incorrect responses received the negative value. Thus scores ranged from +1 to +5 for correct responses, and from -1 to -5 for incorrect responses.

Results

Post-test interview. Only one of the 54 subjects claimed to have noticed the simple clefts ("the sentences with it"). Her results were discarded for that reason, and also because despite the screening procedure, she reported that her native language was not English. One additional subject from the same subject pool was run individually to replace the missing data.

In all groups, the majority of subjects thought that the experiment was testing retention of dates or numbers, and many others suggested that the changes in style from narrative to factual were probably experimental variables. It seems reasonable to conclude that the fillers and distractors were effective.

Analysis. After the experiment was run, it was discovered that one of the passages had been judged to be CN, but was mistakenly labelled CM. This meant that there were in fact ten CN passages and only eight CM. That passage was therefore counted as a CN, and two CN passages were discarded at random, leaving eight passages per level

of C.

The data were analyzed by analysis of variance. The design was a three-way factorial with each combination of context (C), post-target delay (D), and test sentence type (T) assigned to a different level of the dummy variable O (observations), and groups of subjects (S) nested under the other factors. Each group was tested under 18 conditions: two levels of C (motivating and non-motivating contexts) x three levels of D (20, 40, or 80 syllables) x three levels of T (FP, PC, and ID). However, since the ID sentences were treated as distractors, only 12 conditions were submitted to analysis. Each group received each combination of C, D, and T in a different stimulus passage. Since neither subject variation nor differences among individual passages at each level of C were of immediate theoretical interest, the analysis was simplified by treating each combination of subjects and passages as a discrete observation, and the error term for the comparisons of interest contains both sources of variation. This may result in conservative criteria for some of the significance tests. The S and O factors were treated as random, while C, D, and T were fixed.

Table 1 gives the percentage of correct responses and the mean recognition confidence score for each type of change at each level of IM. Table 2 presents the results of the analysis of variance.

The "observations" effect was significant ($F(84,480) = 2.05$, $p < .01$). Since individual differences between passages and between subjects were expected and not of immediate theoretical interest, this factor was not further analysed. However, this decision is discussed in detail in Chapter Five. The main effect of T was significant ($F(1,84) = 33.00$, $p < .001$). Overall, focus-preserving changes were less well recognized than focus-changing alterations of the target sentences. This may be taken as further support for Hornby's (1971) finding that cleft structures function to highlight New information. Changes in which element was clefted are more salient than changes in the device used to cleft that element. This cannot be attributed to memory for the surface form of the sentences, since the FP changes involved a greater number of surface differences (cleft to RPC), but were poorly recognized. Nor can the effect be due to the change in the linear order of the subject and object NP's in the FC sentences, since Sachs (1974) has shown that unmotivated changes from active to passive, which result in a similar re-ordering of those NP's, are also poorly recognized.

The main effect of C was also significant ($F(1,84) = 6.55$, $p < .02$). As predicted by the contextual motivation hypothesis, cleft structures do not have the same memorial (semantic) salience in all contexts.

The significant CT interaction ($F(1,84) = 6.74$, $p < .02$), presented graphically in Figure I, shows that FP changes had nearly identical recognition scores under both context conditions, as one would expect under the assumption that a meaning-preserving change should not be affected by changes in context. This may also be taken as evidence that manipulations of context do not result in unexplained response biases. The interaction effect is due to the fact that the difference between FP and FC is greater in the motivating contexts.

Differences between means were evaluated with the Newman-Keuls test for ordered means (e.g. Kirk, 1968). In this procedure, the critical value that a difference must exceed in order to be considered significant varies according to how many steps apart the relevant means are when placed on a scale ranging from smallest to largest. This is done because if several means are computed by sampling from the same population, the largest and smallest sample means may appear to differ simply because they lie at opposite ends of the same distribution. With the Newman-Keuls procedure, the critical value Wr is largest for the most widely separated means, and smaller for those which lie closer together.

The four differences of interest are shown in Table 3. In non-motivating contexts, FC alterations were recognized better than FP changes ($p = .05$). This was also true for

the motivating contexts ($p < .01$). The effect of contextual motivation is seen by comparing recognition scores for the two context types. The scores for the FP changes were virtually identical under the two conditions, while the FC changes were reliably better recognized when contextually motivated ($p < .01$). The non-significance of the D factor and its interactions suggests that the recognition accuracy for FC and FP changes under both contexts was fairly constant for the three delays examined. This is in accordance with Sachs' (1974) finding, using the same delay intervals, that the greatest amount of forgetting had occurred after 20 syllables. This means that the semantic effect of contextual motivation remains strong for delays up to 80 syllables, just as semantic changes had a recognition advantage in Sachs' study for all levels of D.

Experiment 2

Method

Subjects. Twelve female subjects from an introductory linguistics course at the University of Alberta (mean age 31.7 years) volunteered for the experiment. All were native speakers of English, and had just begun studying English

syntax. Four subjects were assigned at random to each of three test groups.

Stimulus materials. A total of 24 narrative passages were prepared, following procedures similar to those of Experiment 1. The 16 experimental passages all had simple dative sentences as targets, with a human subject, transitive verb, inanimate patient and human recipient (e.g. Arlene brought Hetty the left-overs). These are the restrictions used by Andrew (1974) in her study of focus in dative sentences. Sixteen different verbs were employed: deal, hand, write, tell, bring, rent, show, send, leave, give, sell, offer, read, pass, throw, and teach. Pronouns were used as the subject NP when convenient, but the passages were written such that pronominalization of the direct and indirect objects was never necessary. Half the experimental passages had contexts in which the direct object was informationally New and the indirect object was Given or vice versa. The other eight passages contained target dative sentences in which both object NP's were either Given or New. Since the experimental hypothesis depended on the prediction that subjects would find the New-Given order to be semantically anomalous as long as they recalled the information distribution of the context in which the dative sentence appeared, all the passages used the order Given-New. This decision was reached on the basis of an informal pilot study, in which the Question test was

applied to dative sentences. In each test question, either the direct or the indirect object was replaced by a WH word, and answers using both dative positions were read with falling, non-contrastive intonation. Six subjects were asked to write either the number of the more appropriate answer, or "equal" if both were appropriate. After several practice questions, a total of 60 judgements were collected (six subjects x ten questions). Of these, only 10 were responses of "equal" (six from a single subject). Of the 50 responses expressing a preference, 48 were in the predicted direction (Given-New order, regardless of the syntactic category of the NP). It was concluded that speakers are sensitive to the Given-New strategy, and that the use of the opposite order in the experimental passages would be perceived as unnatural.

In Experiment 1, the FP change - cleft to RPC and vice versa - was used as a basis for comparison with PC changes. Since there is no meaning-preserving syntactic variant of dative position, the filler passages in the present study were used as the control. The fillers contained target sentences representing four syntactic types that are capable of undergoing meaning-preserving transformations: complement deletion, WH-be deletion, particle movement, and adverb movement. These sentences had no further controls; they were considerably longer than the target dative sentences (mean length = 19.7 and 6.8 words respectively),

and most did not involve movement of major constituents. The expectation of no difference in the recognition of changes in unmotivated datives and in filler targets is therefore a very strong statement of the hypothesis that dative movement is meaning-preserving when contextually unmotivated.

All 24 passages were written in three forms, with 20, 40, or 80 syllables of post-target material. Only one test sentence was of interest, involving either the change in dative position, or the minor syntactic change for the fillers. Each passage was therefore administered in only three forms, defined by the levels of D. There were also two distractor test sentences for each passage, and many of these were identical to original sentences. Sample passages are presented in Appendix D. The order of the passages was randomized for each group. The response booklets were identical to those used in Experiment 1.

Procedure. Subjects were tested in groups of four with live oral presentation. The instructions, warmup passages, administration procedures, post-test interview, and scoring procedure were identical to those of Experiment 1. The dative sentences were read with falling intonation, and the New element could not be identified on the basis of pitch prominence.

Results

None of the subjects reported noticing that dative sentences had been frequently used, and the majority believed that the experiment was intended to test memory for factual information when the narrative style was varied.

The data were submitted to analysis of variance, with two fixed factors, D (20, 40, or 80 syllables), and T, which was a cover symbol for the three kinds of test sentences: dative movement in motivating and non-motivating contexts, and syntactic changes in the filler passages. All subjects heard all 24 passages, but under different levels of D. The design was not completely balanced across subjects; due to an error in assigning subjects to groups, some groups received more levels of a given delay than others. However, the data were again analyzed by assigning unique combinations of subjects, passages, and delays to the random factor O, which was nested under D and T. The factor S (groups of subjects) was treated as random, and nested under the other factors. Thus the error term for significance tests contains both subject and passage variability, and significance tests may be conservative.

Table 4 gives the mean percentage of correct responses and the mean recognition confidence score for each type of change at each delay. Table 5 presents the results of the analysis of variance. Only the main effect of T was

significant ($F(2,63) = 24.87$, $p < .001$). Again, the nonsignificance of D and its interactions suggests that recognition accuracy did not decrease significantly with increases in retention interval.

The main effect of T is shown in Figure II. Differences between means were evaluated with the Newman-Keuls test, and the results are given in Table 6. As predicted, changes in dative position were recognized much better under contextual motivation ($p < .01$), as well as being more salient than the changes in the targets of the filler passages. Furthermore, recognition accuracy for changes in unmotivated dative postion was not significantly better than recognition of minor syntactic changes in the filler targets.

CHAPTER FIVE

DISCUSSION

5.1 Introduction

The results of the experiments described in the preceding chapter fully support the notion that contextual motivation has an important effect on the manner in which cleft and dative sentences are interpreted. The evidence for this conclusion will first be discussed in greater detail, and the implications for linguistic and psycholinguistic theory will then be taken up.

5.2 Discussion of the Results

It was suggested in Chapter Two that cleft sentences can have two information functions, one dependent on context and the other contextually unmotivated. If a cleft sentence provides New information invited by the preceding discourse, that element is clefted, and the rest of the sentence is Given. Contextually unmotivated clefts have a New-New information distribution, and the clefting is a context-

independent semantic feature of the sentence. In Baker et al.'s (1973) terminology, the interpretation of information focus in motivated clefts requires sensitivity to both Sd and St information, while focus in unmotivated clefts is a matter of St only.

In Experiment 1, the finding that focus-preserving changes were poorly recognized suggests that recognition can be modelled as a matching process, in which the target sentence is first processed and stored in memory as an abstract semantic schema (e.g. Bransford and Franks, 1972), and false recognitions occur as a function of the similarity of the schemata for focus-preserving variants of the target sentence. The better recognition of focus-changing alterations is then seen to result from mismatches at the semantic level. Since focus-changing test sentences were of the same syntactic type (simple cleft or RPC) as the target, one would expect greater confusion for that kind of change if recognition were based on memory for "surface" structural configurations. The obtained results are therefore taken as evidence that the subjects were responding at least to the St information of cleft sentences.

The better recognition of focus-changing alterations in contextually-motivated clefts can be explained in terms of reconstructive processes in memory (e.g. Buehler, 1908; Bartlett, 1932; Cofer, 1973). If subjects remember not only syntactically-signalled focus, but also the constraints

imposed on sentences by the information distribution at the point in the discourse where the target sentence occurred, one should predict that correct recognition would be facilitated when the New-Given distribution of contextually-motivated cleft and RPC sentences is changed to the inappropriate Given-New order. For unmotivated clefts, the focus changes had no semantic effects beyond the identification function within the individual sentence, and resulted in sentences which were to be equally plausible in that context.

It is a common observation that memory is not only abstractive, but reconstructive, as evidenced by the fact that in recognition tasks similar to those described in the present study, subjects claim to recognize sentences which present explicitly information which is conveyed only through presupposition, implication, or inference in the experimental stimuli (e.g. Bransford & Franks, 1971; Harris, 1974 a, b; Johnson, Bransford & Solomon, 1973; Kevin, 1971; Offir, 1973). Since the identification function of unmotivated clefting has (by definition of "unmotivated") no effect on the interpretation of the rest of the discourse, it is natural that this kind of information should be particularly susceptible to interference and false recognition, as observed in Experiment 1.

In fact, the finding that the unmotivated clefts were remembered as well as they were raises some problems of

interpretation. It will be recalled that in order to allow the use of standard statistics, the effects of subject and passage variability were collapsed into a single random factor O, which served as the error term for all other tests of significance. This confounding meant that the main effects of those two variables, as well as their interactions, could not be tested. Two earlier studies (Fletcher, 1973; Millar, 1976) suggested that there may be significant variability in speakers' interpretation of the focus characteristics of cleft and RPC structures. That possibility was not of immediate interest for the present study, and the significant effect for contextual motivation, in spite of such between-subject variation, suggests that the effect is robust. However, it is also possible that unknown features of the stimulus passages could have caused significant variation between passages and even across the two context conditions. For example, the alterations of the target sentences may not have always resulted in equally natural test sentences. If this were so, it might be expected that presentation of the less natural sentence in the test phase would cause subjects to reject it on the basis of unnaturalness alone.

Inspection of the means for each passage showed that while the focus-changing alterations were recognized better than focus-preserving alterations in over 90% of the observations for motivated clefts, this was true in only

about 65% of the unmotivated clefts. Despite the fact that these figures are based on different groups of subjects, the possibility remains that the unmotivated passages did not constitute a uniform set of stimuli, and more stringent controls might cause this effect to disappear for the unmotivated clefts. However, the validity of the contextual motivation factor is not affected by these speculations, since lower scores for the unmotivated clefts would simply make the contextual motivation effect larger.

The results of Experiment 2 can be interpreted in the same general fashion. Changes in dative position were hypothesized to be semantically non-significant in non-motivating contexts, and the lack of significant difference between recognition of such changes and the recognition of the four meaning-preserving transforms of the targets of the filler passages supports the hypothesis. Again, an abstraction-matching model describes the results. In view of this, Andrew's (1974) finding that the left-most object NP in isolated dative sentences is judged to be the more "important" must be viewed as irrelevant to theories of focus, and the image-construction counterproposal presented in Chapter Three is offered as an explanation of Andrew's linear order effect.

The better recognition of changes in motivated dative position is taken as further evidence that speakers keep track of the information distribution of discourses, and

that in a recognition task they are able to reconstruct the correct order of the object NP's on the basis of memory for which information was Given and which was New at the time they heard the target sentence. This further implies that the choice of dative position is rule-governed, and is based on the general principle that Given information precedes New. Notice in particular that all target sentences were read with steadily falling intonation. This means that the subjects could not have interpreted the NP's as focal on the basis of pitch prominence, as both Chomsky (1971) and Halliday (1967b) suggest.

5.3 Implications for Linguistic Analysis

In the experiments discussed above, syntactic and semantic restrictions were placed on cleft and dative sentences through manipulations of context, and the focus properties of those sentences were found to vary as a function of the informational status (Given or New) of the crucial NP's. These findings have important consequences for sentence-bound linguistic theories of focus.

First, Halliday's (1967b) and Chomsky's (1971) claims that information focus is always associated with pitch prominence are no longer tenable. Experiment 2 demonstrated that "New" status is not always identifable on the basis of features of surface structure, but can be inferred from the

semantic context alone. This is not intended to contradict Chafe's (1970) claim that the frequent correspondence between high pitch and focus allows for effective communication. Rather, the particular intonation contour used in the dative study was chosen to demonstrate that surface structure accounts of focus are neither sufficient nor necessary, since (a) they cannot assign focus to New information which is not pitch-prominent; (b) they cannot distinguish between identical surface forms having different information distributions; and (c) only knowledge of the informational status of the elements of a sentence in context is necessary for determining which element is focal. Sentence-bound theories are therefore obliged to adopt ad hoc solutions to the problem of describing the syntactic reflexes of focus. Thus Chambers' (1970) account of focus, which allows random assignment of arbitrary features to formatives, turns out to be more descriptively adequate than Chomsky's (1971) surface structure account.

The effect of the Given-New principle on dative position suggests an interesting approach to rule optionality in TGG. The Dative Movement rule, traditionally considered to be optional (because either order for the object NP's yields a "possible" sentence of English), is now seen to be obligatory in contexts where one object NP is Given and the other is New. However, the rule cannot be written in terms of syntactic categories, since it is the

information distribution of the discourse, and not the dominance relations within the sentence, which determines the syntactic form and semantic interpretation of the sentence. Of course, this is a moot point for TGG, since Given and New for any particular sentence cannot be determined without reference to context.

The problem of variable interpretation of cleft and RPC sentences is equally insurmountable for a transformational analysis. Again, the relevant variable is the New-Given or New-New status of the cleft and non-cleft NP's. These features are important for the semantic interpretation of members of the cleft sentence family, since the former pairing is associated with information focus and the latter with sentence-level identification.

The major impediment to the development of a formal system which would treat information focus in a non-arbitrary manner is that such a system would have to model the language-user's judgements concerning information distribution. Taken in its strictest sense, this kind of modelling is beyond the scope of formal linguistics, and is perhaps best left to workers in artificial intelligence.

Clearly, what is required is a descriptive system which allows a direct mapping of contextual information (in particular, Given and New status) onto syntactic form. One would then be able to provide rules of syntactic well-

formedness for each information distribution, and the grammar would be truly sensitive to contextual factors. The Information Structure (IS) approach to syntactic description (Prideaux, 1975; 1976) meets these requirements.

Reacting against the pseudo-psychological claims of TGG, Prideaux shuns all formal devices which are not amenable to interpretation as cognitive states or processes: abstract underlying syntactic structures, ordered transformations which move constituents, and rules which relate different kinds of sentences are all rejected as psychologically uninterpretable notational conveniences for making distributional statements about the form of sentences.

Prideaux adopts a functional approach to syntax, in which

> the grammar of a language is a specification, first, of the kinds of information to be conveyed and second, of the linguistic devices used to convey such information (1975, p. 8)

The general procedure consists in specifying the kinds of information (contextual, sentential, relational, and denotational) that can be conveyed by an utterance, and stating "linearization rules" which pair information structure with surface constituent orderings, as well as "surface structure redundancy rules", which state surface structure constraints that are not affected by the

information structure. Since surface structures are directly available to speakers, the surface structure generalizations are presented as hypotheses concerning the generalizations that speakers actually make about their language.

Prideaux (1975) argues that the surface generalization for non-WH direct and indirect object NP placement can be stated simply as a rule which places both NP's after the verb, but leaves the relative order of the two NP's unspecified. This is formalized as follows:

(1) RI: $NP=\{DO, IO\}_{NP \neq WH} \leftrightarrow [X\ VP\ Y\ NP\ Z]_{S}$

The two-headed arrow indicates that when the information structure on the left occurs, the linearization on the right is well-formed.

Notice that Prideaux's formulation is incomplete: the only aspect of information structure treated is the relational information (RI), that the NP's are direct and indirect objects. Obviously, the rules must be altered in order to account for the effect of contextual information on the position of the post-verbal NP's.

It appears that two descriptive statements must be provided, one relating to the case where one NP is [+NEW] and the other is [-NEW], and a second for cases in which both NP's have the same marking for the feature [NEW]. The two statements are:

(2) Dative Position

(a) If two NP's are the DO and IO of a sentence, with one NP marked [+NEW] and the other marked [-NEW], the relative surface order is [-NEW] [+NEW], unless the [+NEW] NP is under contrastive or sentence stress, in which case the order can also be [+NEW] [-NEW].

(b) If the two NP's are the DO and IO of a sentence, and both are [+NEW] or [-NEW], then either NP may precede the other.

Adopting Prideaux's notation, and adding the contextual information (CI), the surface generalizations are the following:

(3) Dative Position

(a) RI: {NPa, NPb} = {DO, IO}
{NPa, NPb} ≠ WH
CI: NPa = [-NEW]
NPb = [+NEW]
⟷ [X NPa Y NPb]

(b) RI: {NPa, NPb} = {DO, IO}
{NPa, NPb} ≠ WH
CI: {NPa, NPb} = [∝NEW]
⟷ [X {NPa Y NPb / NPb Y NPa}]

These rules are surface generalizations, involving a mapping of possible information distributions onto possible orders of elements. On the basis of the results of

Experiment 2, they are proposed here as representing the generalizations used by English speakers in producing and comprehending dative sentences. They are not "movement" rules. Rather, they constitute an output condition on the well-formedness of dative sentences in context, and they claim both that speakers order the NP's according to the Given-New distinction, and that hearers interpret such orders accordingly.

The positioning of New information in sentence-final position (in the absence of contrastive stress) may not be limited to the placement of direct and indirect objects. In simple sentences of the form NP be NP such as Jerry was a crook, it is precisely the [+NEW] information which comes at the end of the sentence, with the same order of Given-New. Of course, with stress on the first NP, and with the change of the indefinite article a to the definite article the, the relative order of New-Given can also be accomplished. The Question Test may be applied in order to show the effect of context on the order of NP's and the application of sentence stress:

(4) Who was a crook?
Jerry was a crook.

(5) What was Jerry?
Jerry was a crook.

Thus, it appears that the general condition on (3) that the two NP's are DO and IO is unnecessary. Such information is necessary for (1), where the general placement of the two object NP's in post-verbal position is required, but in (3) the rule is quite general and extends over a domain greater than that of the direct and indirect objects. It will also be recalled from Chapter Three that the choice of active or passive sentences can be influenced by the information distribution. Thus, one might argue that the rule (3) should be reformulated in more general form as a rule of Given-New distribution:

(6) Given-New Distribution:

(a) $\begin{matrix}\{NPa\} = [\ +NEW] \\ \{NPb\} = [-NEW]\end{matrix}$ $\longleftrightarrow$ $[X\begin{Bmatrix}NPa\ Y\ NPb \\ NPb\ Y\ NPa\end{Bmatrix}Z]$

(b) $\{NPa, NPb\} = [\alpha\ NEW]$ $\longleftrightarrow$ $[X\begin{Bmatrix}NPa\ Y\ NPb \\ NPb\ Y\ NPa\end{Bmatrix}Z]$

5.4 Suggestions for Further Research

The experiments in this study may be taken as further evidence that language users adapt the production and interpretation of their utterances to the "transitory constraints" (Chafe, 1970) that context imposes on them. The notion of contextual motivation might therefore be usefully applied to other sentence types in order to

discover whether information distribution affects their syntax and semantics . A broader goal would be to look for other specific semantic factors which govern sentence organization. For example, Clark's (1965) discovery concerning the preponderance of animate subjects and inanimate objects may be indicative of a favoured animate-inanimate order which could account for the choice of active or passive sentences in informationally neutral contexts.

Another useful step would be a comparison of retention functions for focus and other semantic information. Although the D factor was not significant in the present study, this could be due to the relatively short delays used. The transitory nature of contextual constraints and the need to recall the information distribution at the time of the utterance, suggest that focus information is reconstructed through episodic rather than long-term semantic memory. This hypothesis could be tested in an experiment using both focus and semantic changes, and both short and long post-target delays.

One final observation, which may or may not be of significance, is that in both experiments reported here, as well as in Sachs' studies, the recognition confidence scores for semantic changes were considerably higher after 40-syllable delays than after 20-syllable delays, although this effect did not attain significance in any of the experiments. However, none of the experiments was designed

with such an effect in mind, and exploratory work would be necessary in order to discover whether or not this result reflects a processing or integration effect.

5.5 Summary

In this thesis, the empirical justification for including the terms theme and focus in linguistic and psycholinguistic theories were examined. It was concluded that arguments for positing a separate notion of theme are insufficient, and that the two terms can be subsumed, with no loss of generality, under the more specific notion of information focus. The notions of Given and New information were applied to an analysis of the "focus" properties of English cleft and dative sentences. It was hypothesized that the functional (semantic) interpretation of cleft structures depends on the information distribution of the discourse in which they appear, and a recognition-memory experiment supported this hypothesis by revealing that the "identification" function is less salient than the "information" function, when salience is measured as the degree of success attained by subjects who are asked to identify changes in the element clefted.

It was also hypothesized that dative position in English is not optional, as has been traditionally assumed, but that it is predictable on the basis of information

distribution. This too was supported by the results of a memory task, where changes in dative position were recognized when only one of the object NP's was New. It was concluded that stress analyses of information focus are not sufficient, since at least one intonation contour has been demonstrated to allow New information to be more semantically prominent in spite of the fact that it is not given pitch prominence. Furthermore, even under "normal" stress, a sentence token can be either marked or unmarked for focus, and the informational status of the word in the intonation centre cannot be determined from the "surface structure".

It was concluded that an adequate account of information focus at the sentence level requires statements of the effects of information distribution on syntactic and phonological patterning, and that the Information Structure approach offers a framework within which these effects can be described.

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APPENDIX A

SAMPLE STIMULUS PASSAGES: EXPERIMENT 1

Note: For each passage, the target sentence is underlined, and the breaks at 20, 40, and 80 syllables of intervening material are shown in parentheses. The concreteness of the subject and object nouns of each target sentence is indicated as either 'high' or 'low', and the clefting is labelled as either 'motivated' or 'unmotivated'. In each case, question 1(a) is FP, 1(b) is FC, (c) is ID, and 2 and 3 are distractor questions.

Passage #2: high, motivated

Mrs. Bucknell was an old lady of decidedly conservative nature, and she frankly admitted that she had "not been particularly keen" to associate with her bartender brother-in-law or even her sister after their marriage. She wished that her sister had married a poet, painter, sculptor, or at least an architect. She did not say outright that she found Chester too low-class: she expressed it negatively: "not refined enough." It was the alcohol that this woman objected to. Her long-standing membership in the Free Women's Temperance League prevented her from (20) accepting into the family a relative who dispensed liquor for a (40) living. When asked about her sister, she would utter not more than two little words: "Oh, well," and on being urged to say more about her, she stuck to her "Oh, well," and (80)

1. (a) The alcohol was what this woman objected to.
   (b) It was this woman that objected to the alcohol.
   (c) It was the alcohol that this woman objected to.

2. She wished her sister had married a poet, painter, sculptor, or at least an architect.

3. She did not say outright that she found Chester too

low-class; she expressed it negatively: "not refined enough".

Passage #14: high, motivated

There is much speculation about the history of the game of backgammon. An old Egyptian folk tale seems to confirm the existence of the game in the Nile Valley around 1500 B.C. The eccentric Queen Hatshepsut is said to have been so envious of a marvellously decorated backgammon board belonging to Enkomi of Cypress, that she challenged him to a single game with incredible stakes: the loser was to exchange his kingdom for the winner's board. It should be noted that Hatshepsut was well known for her lack of interest in politics. It was the board that interested the woman. According to the tale, she purposely lost the game, as well as her control of (20) Egypt. It is said that she moved to Cypress where she lived as a peasant until (40) her death. Backgammon boards dating from Queen Hatshepsut's time have been found in King Tutankhaman's tomb, as well as on Cypress. One board contains Queen Hatshepsut's name, and (80)

1. (a) The board was what interested the woman.
   (b) It was the woman that the board interested.
   (c) It was the board that interested the woman.

2. There is much speculation about the history of backgammon.

3. An old Egyptian folk tale seems to confirm the existence of the game in the Nile Valley around 7500 B.C.

Passage #8: RPC subject, low, motivated

When introducing a servant to the household, all members of the family, even the baby, have the newcomer introduced to them - never the other way around. Children below their teens are called by their first names by servants, unless they are titled. In their teens, they may be called "Master James" or "Miss Ellen", except by older family servants who have known them from infancy. They may retain the first-name privilege until the children reach majority. It is a rare servant who arrives in your household perfectly trained. His ability is what got him

that position. But even if he or she was by far the best suited for the job, it will still (20) be necessary to train him or her to the customs of your house. And you can't expect (40) the job to run itself without direction - and often some aid - from you. The nagging employer who is never pleased with the cook's work, but who cannot cook (80)

1. (a) It is his ability that got him that position.
   (b) It is that position that his ability got him.
   (c) His ability is what got him that position.

2. They may retain the first-name privilege until the servants reach majority.

3. Servants rarely arrive in your household perfectly trained.

Passage#18: cleft object, low, motivated

Down here at the power plant they've figured out a new way to watch all these valves and gauges by computer. I don't claim to understand how a machine can do my old job, but that's the way a lot of jobs are going these days - new machines, new methods. Not that I'm going to be out of work. It's just that things will be a lot different for me - a lot less to do. Some guys have had their pay cut because of the machines, but I've been lucky. It's my duties that their methods have changed. My pay isn't affected. Now I'm more of a security guard than anything, (20) I guess. I have to check the doors every hour, and call up Security if (40) there's any funny business going on. Not that I've ever known anything very unusual to happen here - no sabotage on the day shift. We're not at war, you know. (80)

1. (a) My duties are what their methods have changed.
   (b) It's their methods that have changed my duties.
   (c) It's my duties that their methods have changed.

2. It won't affect my pay.

3. Now I'm going to be out of work.

Passage #3: cleft subject, high, unmotivated

It's surprising the number of myths that have grown up around what we eat. Some claim that garlic has magic healing qualities, while others maintain unswerving loyalty to vitamin and protein supplements. Such single-mindedness is silly. We need all nutrients - the vitamins, minerals, proteins, sugars - all of them, in balance, every day. We should be careful not to spoil our appetites with unhealthy food products. <u>It's the sugars that the doctors are studying these days</u>. We should all be concerned about junk foods.

Of all the nutrients, minerals such (20) as iron and calcium are the most neglected. Even less prominent in (40) the nutrition lore is guidance about trace minerals. They are needed by our bodies in very minute amounts, but are available quite readily in (80)

1. (a) The sugars are what the doctors are studying these days.
   (b) It's the doctors that are studying the sugars these days.
   (c) It's the sugars that the doctors are studying these days.

2. The number of myths that have grown up around what we eat is surprising.

3. We should be careful not to stimulate our appetites with unhealthy food products.

<u>Filler passage #6</u>

An Edmonton woman asked city police Thursday to find two bogus fortune tellers who duped her out of about two thousand dollars last month. The middleaged woman went to the pair to get rid of a curse on her family. The curse made it impossible for her to sell her property, among "a lot of other troubles". "It has been on us for at least twenty years," she told The Journal. But the angry woman says the fortune tellers failed to lift the curse. "I've been robbed. There's nc doubt about that. And I'm sure I'm not the only one these two have duped. It's really upsetting, this robbery in broad daylight. Police said she went to a residence on 97th Street and 122nd Avenue...

1. The curse made it impossible to sell her property, among "a lot of other troubles".

2. And I'm sure that I'm not the only one that these two have duped.

3. The pair went to the middle-aged woman to get rid of a curse on their family.

Filler Passage #15

Recent research into the social impact of the mass media has turned toward the effects of violence on audiences. A report to the Cntario Royal Commission on Violence in the Communications Industry says the rock music industry has become so big that musicians are increasingly able to manipulate their audiences. It is this manipulation that represents the true violence in popular music, says the report, prepared by Peter Goddard, music critic for the Toronto Star. The report, which examined violence in popular music and in pop music culture, is the 26th of 28 commissioned. "Frequently, the image created by the makers of pop music today is deliberately designed to portray the world as a violent, chaotic place...

1. The report, which examined violence in popular music and in pop music culture, is the 26th of 28 that have been commissioned.

2. Frequently, the image created by the makers of pop music today is deliberately designed to portray the world as a violent, chaotic place.

3. Recent research into the impact of the mass media on society has turned toward the effects of violence on audiences.

APPENDIX B: INSTRUCTIONS AND WARMUP PASSAGES

This experiment is designed to discover how much you are able to remember about sentences that you hear. I will read you a series of passages on various topics and in different styles. At a certain point in each passage, I will stop reading - perhaps in the middle of a sentence - and then I will read three test sentences. Your task is to decide whether these sentences are identical to sentences you heard in the passage, or whether they have been changed in some way. For each test sentence, you should circle the correct word - "identical" or "changed" - on your answer sheet. Then you must express your confidence in your answer by circling one of the numbers from 1 (very low confidence or a guess) to 5 (very high confidence). Some of the test sentences are harder than others, so please feel free to use the entire range of the scale during the experiment. On the other hand, don't be concerned if you find that you are using some numbers more than others, so long as that reflects your true feelings about the answers you give.

Before we try the practice passages, do you have any questions?

****

Listen to the first passage, marked A on your answer sheet. As I give each test sentence, circle your answer - "identical" or "changed" - as well as the appropriate confidence rating. I will pause for only seven seconds between test sentences, so mark your answers as quickly as possible. I will go on immediately to Passage B, then pause to discuss these passages. Are you ready?

Practice passage A: Police today searched for the "why" of a multiple shooting Thursday that left eight people, including a heavily armed suspect who ran amuck near a mall crowded with nighttime shoppers, wounded on city streets. "We keep asking ourselves why it happened and we just don't know," police inspector Mel Bestwick said today. Police said a man walked out of a house near the Westbrook Shopping Mall Thursday night, and then "all hell broke loose". Shoppers in the quiet southwestern section of the city scattered when the shooting began. Little more than ten minutes later, eight people, including two police constables, lay wounded on the streets and on the mall. Two of the wounded were reported...

1. Little more than twenty minutes later, eight people, including two police constables, lay dead on the streets and in the mall.

2. Shoppers in the quiet southwestern section of the city scattered when the gunman began shooting.

3. "We keep asking ourselves why it happened, and we just don't know".

Practice passage B: If your thumb isn't green or you don't have the time, patience or space to grow your own fruit, you can lease your very own orange tree. Citrus grower Jacques Giddens, who farms 40 acres of naval oranges near the Central California community of Orange Cove, will lease you one of his trees for 12 dollars a year.

The tree will produce approximately 160 pounds of oranges. That's enough to keep the average family in good supply for most of the year. Actually, depending on where you live, it will cost you somewhat more than twelve dollars

a year. Giddens insists that you pay freight costs to have the oranges shipped to you by truck. "For the 12 dollars plus shipping costs I will farm each tree, pick the crop and ship it to the lessee," he said. "It will be like having your own one-tree farm with a hired hand to take care of it." Even with shipping costs...

1. That's enough to keep the average family in good supply for most of the winter.

2. The tree will produce approximately 160 pounds of oranges.

3. Giddens insists that you pay freight costs for having the oranges shipped to you by truck.

****

In Passage A, about the shootings, sentence number 1 was changed by substituting the word "dead" for "wounded". Listen to the pair of sentences (...) Sentence number 2 had this change: "when the shooting began" became "when the gunman began shooting". Even though the meaning was the same, the correct answer was "identical", because different words were used. (...)

You should see now that some changes will be more obvious than others, and that sometimes there is no change at all. Did you notice differences in your confidence ratings?

If you have any questions, please ask them now. Once the experiment is under way, I cannot stop for any reason. Are you ready to begin?

APPENDIX C: TABLES

Type	Delay	Non-motivating		Motivating	
		% corr.	Mean	% corr.	Mean
Focus-Preserving	20 syll.	41.67	-0.56	52.08	-0.04
	40 syll.	47.91	-0.02	35.41	-0.83
	80 syll.	50.00	-0.12	47.91	-0.13
Focus-Changing	20 syll.	54.16	0.75	75.00	2.58
	40 syll.	60.41	0.90	93.75	3.58
	80 syll	68.75	1.21	83.33	2.52

Table 1: Per cent correct and mean recognition confidence score for each type of change at each delay. (Experiment 1).

Source	df	Sum of Squares	Mean Square	F
Mean	1	406.69	406.69	19.86**
C	1	134.17	134.17	6.55*
D	2	7.25	3.63	0.18
T	1	676.00	676.00	33.00**
CD	2	3.82	1.91	0.09
CT	1	138.06	138.06	6.74**
DT	2	18.26	9.13	0.45
CDT	2	43.16	21.58	1.05
O(CDT)	84	1720.56	20.48	2.05**
S(CDTO)	480	4804.95	10.01	
Total	576	7952.92		

Table 2: Analysis of Variance, Experiment 1.

	FP, CN	FP, CM	FC, CN	FC, CM
FP, CN	--	.01	1.20*	3.15**
FP, CM	--	--	1.19*	3.14**
FC, CN	--	--	--	1.95**

W_2 = 1.00 (p = .05) W_3 = 1.20 (p = .05) W_4 = 1.32 (p = .05)
= 1.20 (p = .01) = 1.51 (p = .01) = 1.63 (p = .01)

Table 3: Newman-Keuls test, Experiment 1. FP and FC refer to focus-preserving and focus-changing alterations, respectively. CM and CM refer to motivating and non-motivating contexts, respectively.

	Motivated Dative		Unmotivated Dative		Filler	
Delay	% corr.	Mean	% corr.	Mean	% corr.	Mean
20 syll.	68.75	1.66	46.87	-0.47	56.25	0.16
40 syll.	78.12	2.59	34.37	-0.97	21.87	-2.28
80 syll.	78.12	1.97	43.75	-0.69	25.00	-1.91

Table 4: Per cent correct and mean recognition confidence score for each type of change at each delay level (Experiment 2).

Source	df	Sum of Squares	Mean Square	F
Mean	1	0.00	0.00	0.00
T	2	634.01	317.00	24.87**
D	2	28.01	14.00	1.10
TD	4	100.85	25.21	1.98
O(TD)	63	803.11	12.75	1.13
S(TDO)	216	2441.95	11.31	
Total	288	4007.93		

Table 5: Analysis of Variance, Experiment 2.

	Filler	Unmotivated Dative	Motivated Dative
Filler	--	0.64	3.41**
Unmot. Dative	--	--	2.77**

W_2 = 1.03 (p = .05)
= 1.37 (p = .01)

W_3 = 1.24 (p = .05)
= 1.56 (p = .01)

Table 6: Newman-Keuls test, Experiment 2.

APPENDIX D

SAMPLE PASSAGES, EXPERIMENT 2

Note: The target dative or filler sentences are underlined, and the breaks at 20, 40, and 80 syllables of intervening material are shown in parentheses. The positions of the direct and indirect objects (DO) and (IO) are indicated in the title, as is the motivation ('motivated', 'unmotivated', or 'filler').

Passage #3: IO final, motivated

Carla couldn't stop talking about the great deal she'd got on the '65 Cadillac, and she had good reason to boast. It was the envy of all her car-loving friends - a maroon monster that came to be known as the Batmobile. So of course, when she decided to sell everything she owned and take off for Mexico, she was flooded with offers. That put her in the difficult position of having to choose the lucky new owner from among her friends, and that boiled down to choosing between Mike and Howie, both of whom shared a liking for her, and a dislike for one another. She sold the car to Howie. Not for any special reason; things just turned out that way. He and Mike were over (20) one afternoon, both having dropped by without calling ahead, and neither willing (40) to leave the other alone with her for the rest of the day. Eventually the conversation got around to the Batmobile problem and Howie mentioned that (80) ...

1. She sold Howie the car.

2. Not for any special reason; it just turned out that way.

3. It was the envy of her car-loving friends - a maroon monster that came to be known as the Batmobile.

Passage #16: DO-final, motivated

The weather turned very cold; Christmas came and went. Hetty's cough came back, and she spent most of her time under a pile of blankets and old clothes, dozing. Arlene now resented her staying there. She really couldn't afford to feed her, but she couldn't turn her away, either, at least not until she recuperated. In the evenings the clatter of dishes and pans would drift up the stairwell, and the steamy cooking smells seemed to promise a hearty meal.

But Arlene always brought Hetty the leftovers. In the week Hetty turned seventy years old, Arlene told her that she should move to (20) a Home run by the Council out in the northern suburbs. Hetty enjoyed lively (40) London, but she had no alternative. The last two winters had set her bones aching badly, and a cough was never far away. And while perhaps she might still find (80)

1. But Arlene always brought the left-overs to Hetty.

2. Arlene was now resentful of her for staying there.

3. The weather turned very warm; Easter came and went.

Passage #24: IO-final, unmotivated

The employees, still wearing their uniforms, filed out of the building - machinists in gray smocks, technicians in jeans and T-shirts, engineers in ties and shirt-sleeves. The air was fresh, the slight breeze conveyed a gentle warmth from the spring sun. Cowan and Taylor emerged from the building and made their way through the crowd of workers to a makeshift stage that had been prepared for the ceremony. Taylor said a few words of introduction, and announced the change in the programme. Then he handed the microphone to Cowan.

"Gentlemen, Governor Rockefeller has sent the following telegramme, which (20) I'd like to read. 'To the employees of Dower Aeronautics: The award of (40) this contract, so vital to the security of our nation, to a firm located in this state and employing local help, represents a great and sacred (80)...

1. Then he handed Cowan the microphone.

2. Taylor said a few words of introduction, and announced that the programme would be changed.

3. The air was fresh, the slight breeze conveyed a gentle warmth from the summer sun.

Passage #24: DO-final, unmotivated

It was about ten o'clock in the morning and Sylvia and I were sitting alongside the machine on a cool, shady curbstone in Smiths Falls, Ontario. Geoff was at the Laundromat doing the laundry for all of us. Gord was off looking for a visor to put on his helmet. And I was about

to sharpen up the engine a little. Just as I was setting up the tools, the local street evangelist came up to us and pulled out his Bible. He read Sylvia a couple of verses. I'm not sure what they were, not having much Bible training myself, and I guess I (20) really wasn't listening. On this machine I've done the tuning so many times (40) it's become a ritual. I don't have to think much about how to do it anymore; I mainly look for anything unusual. The engine has picked up (80)

1. He read a couple of verses to Sylvia.

2. Geoff had gone to the laundromat to do the laundry for all of us.

3. Just as I was setting up the tools, the local street evangelist came up to us and pulled his Bible out.

Filler #7: Particle movement

She sat in the middle of the back seat with John Wesley and June Star on either side of her. Bailey and the children's mother and the baby sat in front and they left Atlanta at eight forty-five with the mileage on the car at 55890. The grandmother wrote this down because she thought it would be interesting to say how many miles they had been when they got back. It took them twenty minutes to reach the outskirts of the city.

The old lady settled herself comfortably, removing her white cotton gloves and putting them up with her purse on the shelf in front of the back window. The children's mother still had on slacks, and still had her head tied up in a green kerchief. The grandmother was wearing a navy blue straw sailor hat with a bunch of white violets (20) on the brim and a navy blue dress with a small white dot in the print. Her (40) collars and cuffs were white organdy trimmed with lace and at her neckline she had pinned a purple spray of cloth violets containing a sachet. In case of accident, (80)

1. The children's mother still had slacks on and still had her head tied up in a green kerchief.

2. They took twenty minutes to reach the outskirts of the city.

3. She sat in the middle of the front seat with John Wesley and June Star on either side of her.

APPENDIX E: FIGURES

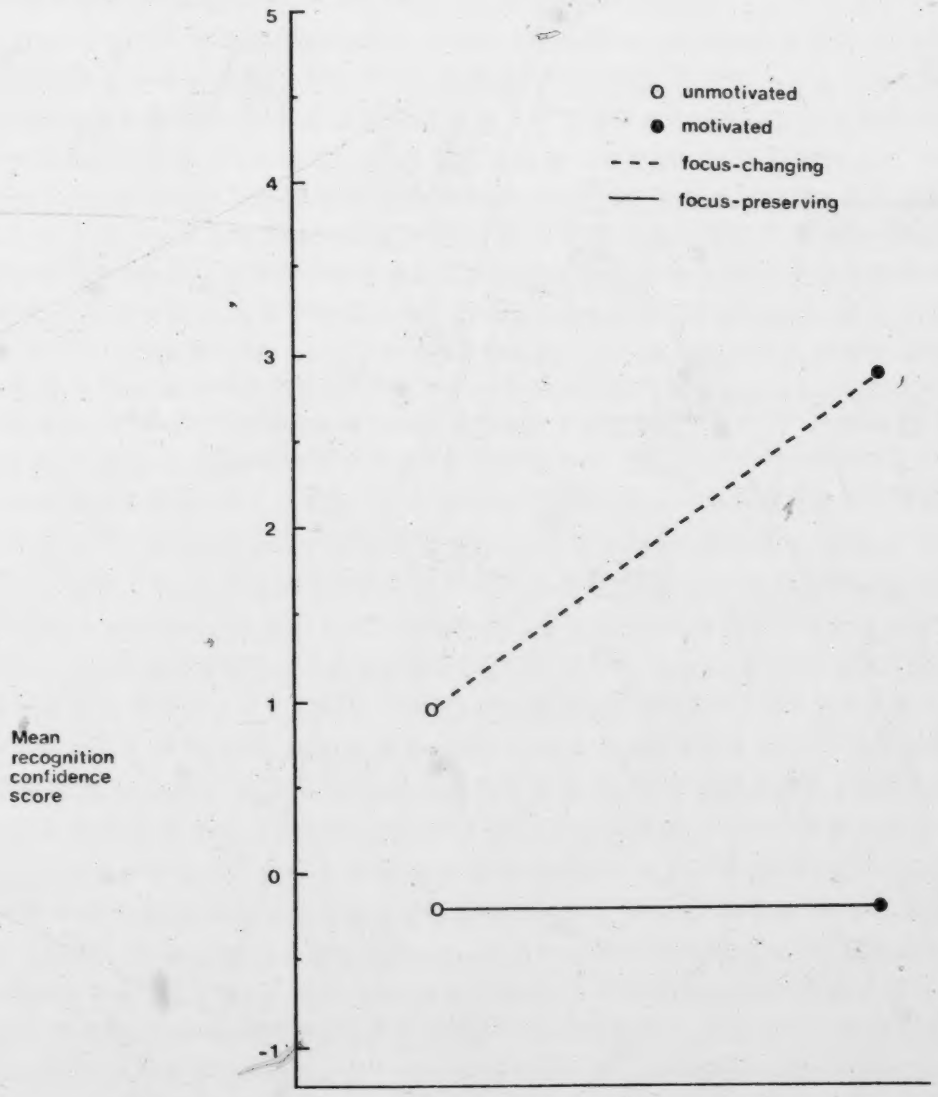

Figure 1: Context by type interaction, Experiment 1.

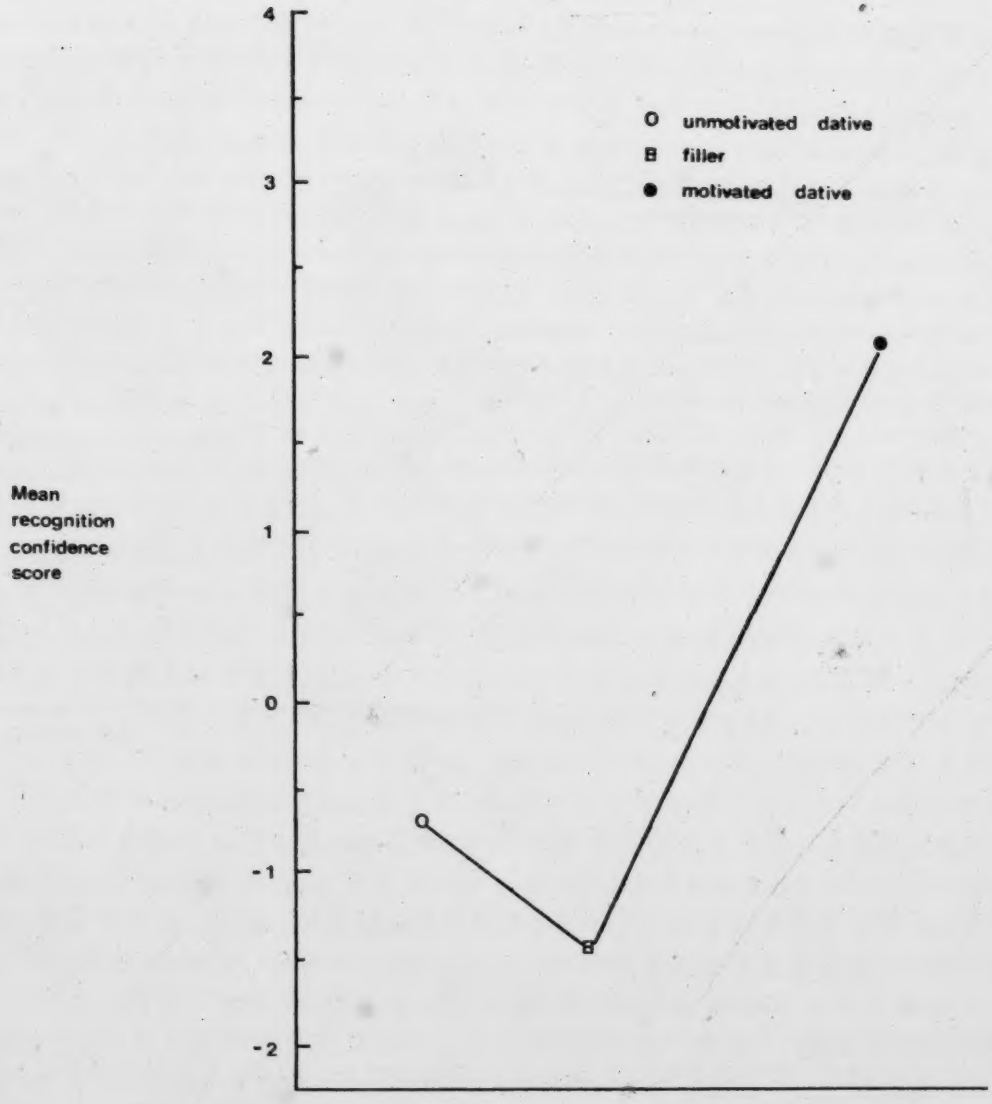

Figure II: Main effect of test type, Experiment II.